

NATIONALS OPEN CLASS STICK WINNER

MODEL AIRPLANE NEWS

13th Year of Publication

DECEMBER 1941

20c



Handley Page "Halifax"
Long Range Bomber

★ ★ ★ ★ ★ ★ ★ ★ ★ ★ ★ ★ ★ ★ ★ ★

A VITAL MESSAGE

REGARDING

MODEL AERONAUTICS

AND THE

NATIONAL DEFENSE PROGRAM

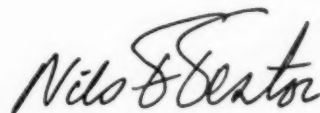
★

America . . . mightiest nation in the world . . . has gone all out for defense! As planes and tanks and guns roll from assembly lines in ever-increasing numbers, it is unavoidable that the pinch of vital priorities should halt the flow of less essential goods. This, we realize, is as it should be.

For one entire industry, however . . . already slowing in pace, soon to be forced to stop completely . . . we bespeak understanding and consideration. *That industry is model aeronautics!* Unless production is allowed to continue on its plane kits, its motors, its supplies and materials . . . aeromodeling must be grounded for the duration.

Model aeronautics . . . born of our country's pre-destined leadership in aviation, nurtured by that surging enthusiasm with which America always drives forward . . . is a defense industry just as surely as though its balsa wood ships patrolled the skies in combat zones! Here is vital education in airplane design and construction, basic training in principles of flying, actual first-hand knowledge of today's world of aviation on which young leaders will build the new world of tomorrow's aviation.

Surely such an industry has a story to tell that is deserving of being heard . . .



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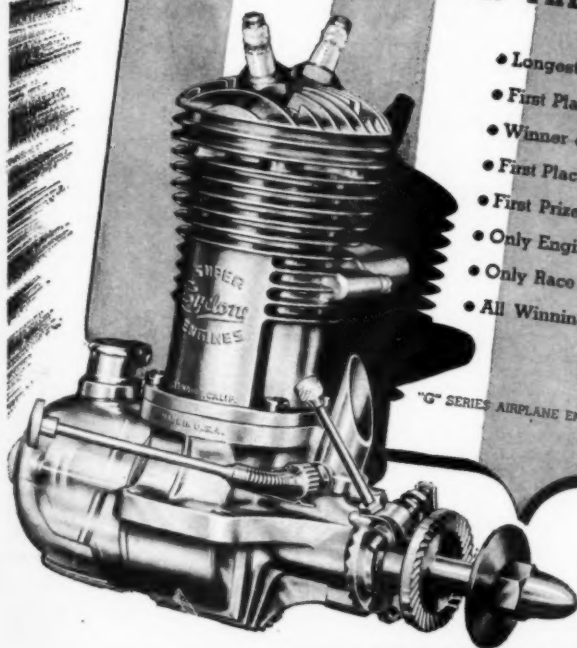
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ON THE BEAM

TEN YEARS AGO the Guggenheim Foundation made a survey of model airplane activities in the United States and made the startling discovery that five million boys were building and flying model planes. It was from this huge reservoir of boys, now grown to manhood, that the army, navy and aviation industry drew for the gigantic task of outflying, outproducing in a few years what it took the efficient Nazi machine a decade to accomplish.

THE GERMAN Government was far more absorbed in its air-minded youth than in its labor battalions and educated the former in such numbers that they became the world's foremost airpower. In our country private enterprise and aviation-minded educators have done a comparable job. And now this source of learning is being dried up by the blistering friction of priorities.

IT MUST BE obvious even to the dullest that only those nations that can maintain air superiority will survive the assaults of those leaders who lust to wear the bloody mantle of historic greatness. This being so, where is our long range aviation planning for the future? Who is guiding the American modeler from his gas job to the next logical step, gliding? And from the glider to the light plane, and eventually to the five hundred mile an hour pursuit?

THE ANSWER is that there is no guiding genius of American aviation.

OF COURSE, THE model plane industry will survive—as all forces of progress survive. But its slowdown must be deplored. A clearheaded flyer, acting as co-ordinator of all aviation activity, present and future, would not be indifferent to the modest needs of air-minded boys.

AND THIS brings us to an obvious conclusion, which is not buttressed by many other powerful arguments in its favor. The land and its defenses should be the concern of the Secretary of War; the sea and its far-flung outposts should be the responsibility of the Secretary of the Navy. But the air belongs to youth and its problems will eagerly be shouldered by youth—under the aegis of a Secretary of Aviation.

13TH YEAR OF PUBLICATION

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Edited by

Charles Hampson Grant

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Model Airplane News - December 1941

DON'T PUT YOURSELF BEHIND THE 8-BALL

BY INADEQUATE
'JOB' TRAINING!



*Aviation has JOBS for thousands,
but CAREERS only for trained men!*

There has never been a greater opportunity for you to enter a secure, interesting and profitable career in aviation, but you can only do so by training properly to fulfill the responsibilities of that career. While many are taking advantage of the national emergency to get into the back door of aviation with short, cheap "job" courses, they are only fooling themselves—for they can't fool aviation executives. Aviation's leaders are not going to give responsible supervisory positions to inadequately trained men. The "quickee" trained man must remain in single phase jobs lasting only as long as the present emergency. The men who have made aviation THEIR career demand adequate training and they know that Curtiss-Wright Technical Institute graduates are—and for many years have been—thoroughly qualified to fill the industry's most exacting requirements.

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training, which pointedly indicates the high standing Curtiss-Wright Tec has attained in the aircraft industry since its establishment in 1929.

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WHO WANT
GAS MODELS
THAT LOOK
LIKE REAL
AIRPLANES

★ Out of the West (where every other man in the street is a model bug) comes the *Westwind*, and those who have been following recent model news know it has had one of the most enthusiastic receptions ever given by modelers to a new ship! Light, trim, yet remarkably rugged. Exceptionally compact lines; looks and acts like a modern hi-speed airplane. Best of all, the slotted wings completely do away with stalling and whipping. This ship was designed following the latest N. A. C. A. tests. Fly with any Class B or small Class C engine. **\$3.85**

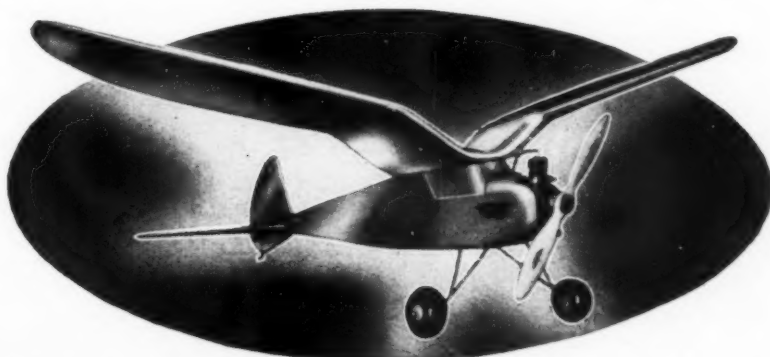
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THE
GULL-WING
"SPOOK"

Spook "48"
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★ The *Spooks* travel! Like other Modelcraft kits, they were designed to give modelers something in advance of current trends and still retain legitimate airplane lines. Since the announcement of the *Spooks*, this type ship has been put in production for the U. S. Navy. SPOOK 48—Class A or B—total weight with motor, 18 oz. SPOOK 72—Class C—total weight with motor—48 oz. See your dealer or AIR MAIL order for prompt delivery.

Spook "72"
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A Heinkel Jager, one of Germany's heavily armed bombers. Note gun turrets on top and bottom of fuselage



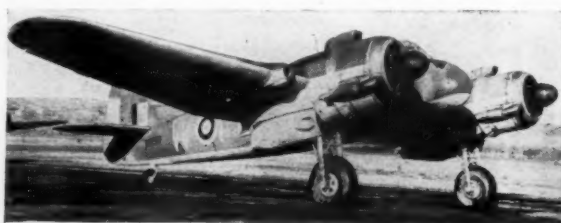
The German Stuka dive-bomber is ugly but deadly. This is the plane that has been so widely used in combat. More have been manufactured than any other type, it is said



The British Blackburn Roc is a heavily armed fighter of the Fleet Air Arm. It is one of Britain's most efficient warplanes



Two Russian aviators study war maps before a flight in their Chato pursuit bomber, seen in the background. It is being used as a dive-bomber on the Eastern Front



The Bristol Beaufort, high-speed heavily armed night fighter



The British Whiteley, long range bomber. This type has been used in bombing Germany very effectively. It carries an enormous load of bombs and is heavily armed fore and aft

NEW WAR WINGS

A Comparison of Performances and Unique Features of War Planes Now in Mortal Combat at the Front

AT THE outbreak of World War II we noted briefly the kinds, types and numbers of warplanes by the major European powers then on hand. In "War Wings Over Europe" (MODEL AIRPLANE NEWS, January, 1940) the vicious, snarling testing ground of actual combat lay ahead; the maddening tempo of wartime necessity had not caught the aircraft designer into its gasping maw and whipped him into a frenzy of engineering effort.

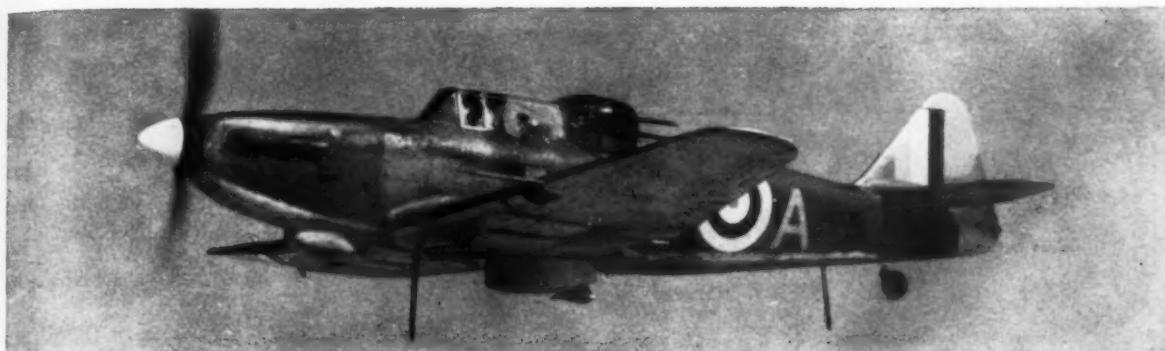
Now the war is past its first year, hurrying towards its second. Now we have something to go by. We have the thousands of stories from the Front, telling of successes and failures of the types we mentioned. And now,

too, we have news of the "war babies," planes designed and built under actual combat pressure.

But before we take another long range look at the situation, a whole year later, let's pause for a moment and see what strengths and weaknesses time has brought out in the varied types.

Surprise plane of the War has been the British Hawker Hurricane. It has out-classed every ship in the air, including its highly-touted twin, the Spitfire, more than proving the British Air Ministry's confidence in it was not, by any manner of means, misplaced. As to just why the Hurricane, with its wooden aft framework, fabric covering and blunt-looking lines has become the Number One ship is hard to say. It is not the fastest, certainly, but its various features in combination have made it an outstanding success. Large numbers in two recently improved versions

are on hand with many more thousands under construction in Canada and Australia, as well as in England's vast shadow plant system. Among improvements are substitution of three-bladed all-metal controllably-pitch propeller for the awkward two-bladed wooden model, all-metal wing, redesigned



The 300 m.p.h. Boulton Paul Defiant that has been used regularly for night fighting. It mounts a 4-gun turret to the rear of the pilot

OVER EUROPE

By LARRY McROBERTS

landing gear and more powerful version of the Rolls-Royce "Merlin" engine in its nose. Latest figures give the Hurricane Mark III fighter a top speed of 386 miles per hour, incredible for its weight and appearance.

The German Luftwaffe's faith in its Messerschmitt Me-109 strength was not misplaced either but the ship's greatest strength has been in its great numbers. At the outbreak of the war as many as five hundred of these were seen in a single day over London, but they are rarely seen over the Empire's capital city today.

Another surprise ship has been the Messerschmitt Me-110 twin-engine fighter which was comparatively unknown at the onslaught of hostilities. Great speed and sheer fire-power has made it a terrible weapon to deal with, although it too, has been shot down in great numbers near London.

We were fortunate enough to have the opportunity of examining this airplane in Los Angeles recently and immediately got the impression: "Well, it looks like it CAN do all the things they say it can!" The Me-110 is a small plane, not in dimensions but in size and weight of various components. The fuselage is slim and light, wings thin, tail neat. Everything unnecessary has been excluded; the ship carries only crew, engines and armament, all that is necessary for a modern short-range combat plane. Its

great speed, then, comes from this cutting down of excess weight, simplicity of design cutting down excess drag, and great power delivered to the air with a minimum of mechanical loss.

A later and somewhat heavier version of the Me-110 has appeared as a bomber with a glass-in nose and a fourth member of the crew forward.



The famous twin engine Messerschmitt Me-110 fighter. The Germans have built this type in large quantities; it has a tremendous firing power and is very fast



The Blackburn Botha, one of Britain's latest reconnaissance, torpedo-carrying bombers. Note the gun turret on top of the fuselage



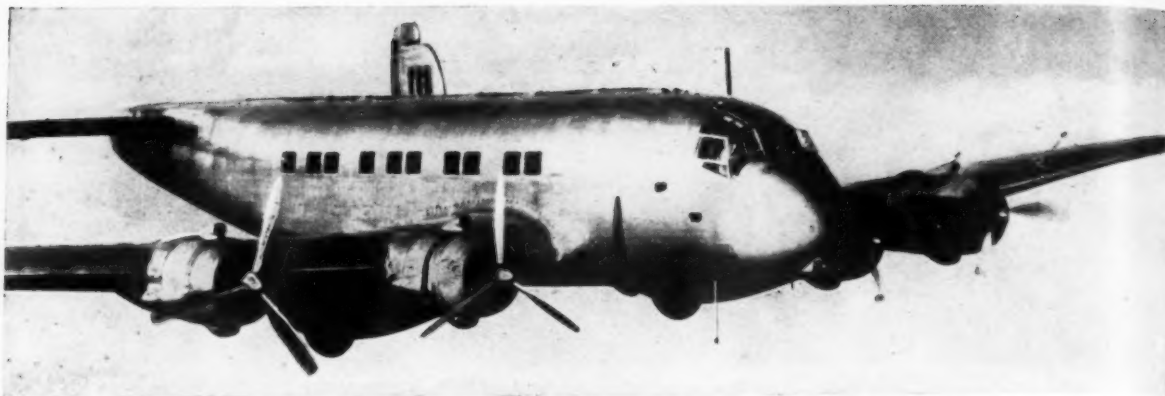
Here is the Saro-Lerwick, latest flyingboat being put in the service of the R.A.F. Coastal Command. It is doing excellent service hunting U-boats



A famous, highly maneuverable Russian Mosca snubnose pursuit ship takes off. This is being used effectively against the Germans



A radio photo direct from the Front; one of Russia's modern medium bombers, being rolled to its hiding place in the woods



A 4-motor Junkers 90, 40 passenger transport said to have been recently used as a bomber during raids on England

The Heinkel He-111K Mark V twin-engine bomber, Junkers Ju-86K and Dornier Do-215 bombers have all been comparative failures; they have come down in the Midlands in droves! In one day fifty-four bombers fell in England. They have so little disposable (bomb) load great numbers are necessary to cause consequential damage in a raid. Also their defensive armament is poor and only speed and high-altitude ability make them opponents of the R.A.F.

By far the best ship of this class is the Junkers Ju-88; the fastest, best armed and greatest load-carrying member of the Luftwaffe. They are powered by Junkers Jumo direct injection engines and have come to be greatly respected by defending fighters.

Complete flops have been the Junkers Ju-87B "Stuka" dive-bombers which gained such great notoriety in their attack on completely unarmed Poland. Over the Channel in the early weeks of the war, Stukas could be seen going down under the flame of R.A.F. fighters almost hourly; four months later they were removed and sent to aid the Balkan campaign.

Also flops have been the vastly vaunted Heinkel fighters, the He-112 and later He-113 which were claimed the fastest things on wings. This claim being partially true, they were also the fastest things on wheels; these killer planes took such a terrific takeoff and landing toll of Luftwaffe personnel they were grounded and none has since been seen over England.

Another successful ship has been the "Wellington" heavy bomber with its famed geodetic construction. The Mark II with its Rolls-Royce Merlin liquid-cooled engines is surprisingly fast for its size and weight and all R.A.F. raids of military importance have been carried out in these huge ships whose tremendous load-carrying ability and defensive armament (two power-driven turrets at nose and tail) has made it the war's outstanding bomber.

The Blenheim, reputedly the fastest bomber a-wing at the outbreak, has not proved so. Its light load and short range has made it useful in the R.A.F. equivalent

of our "attack plane" category and its work in the Southern Campaign has been particularly commendable.

The Handley-Page Hereford (MODEL AIRPLANE NEWS, January, 1939 issue) and Hampden (MODEL AIRPLANE NEWS, June, 1941 issue) medium bombers have had outstanding successes in the North Sea and in the Berlin raids but their load has not permitted really destructive assaults on German military objectives.



The British Hampden; fast, medium, heavily armed bomber used over Germany

An almost humorous success has been the ubiquitous but perennial Fairey "Swordfish," an ancient biplane torpedo-spotter-reconnaissance seaplane operating from British cruiser decks. Catapult launched, this creaking three-seater of wood-linen-struts-wire vintage almost single-handedly licked the Italian fleet in the Battle of Cape Matapan off the Southern coast of Greece. Perpetually in the Italian hair during the Albania campaign and even more effective in the fighting off Salonika, these venerable crates have more than earned their place in the R.A.F. Hall of Fame; they've been in action only during the past seven months in the Mediterranean!

So much for today's "War Wings Over Europe." What about planes and engines that will inherit the fight tomorrow? Here are some of them:

LUFTWAFFE—
ENGINES: The Bay-

erische Motoren Werke A.G. in Munich, manufacturers of B.M.W. Pratt & Whitney licensed engines, are now in production on the Nazi equivalent of the Twin Wasp, a fourteen cylinder, radial, air-cooled engine developing 1,300 horsepower for take-off and 1,150 for altitude performance. The latest Junkers "Jumo" direct petrol injection motor, have completed a new 1,140 horsepower model. The latest Daimler-Benz DB-601 series has now been upped in

horsepower to 1,375 and a new series, the DB-605, will soon be ready and will be the Luftwaffe's most powerful engine. This new model is a 24 cylinder double-601 and is being built in two series, 2,375 horsepower and the 2,500 horsepower versions. These engines, still very much in the experimental stage, will be used on new quadri-motor long range bombers only, their 8,225 pounds dry weight being as much as the modern German fighter's total gross weight.

FIGHTERS: Now in production is the Focke-Wulf Fw-187 "Zerstorer" (Destroyer) twin engine long-range fighter powered by two Daimler-Benz DB-601 engines of 1,150 horsepower each. This trim, lightweight combat plane has a crew of two, wing span of 51 feet, length of 33 feet and wing area of 315 square feet. It has a top speed of 362 miles per hour at 19,685 feet, can climb to 20,000 feet in 5.8 minutes and

(Continued on page 30)



The Ju-88, Germany's newest medium bomber being used to bomb England from bases in France

NATIONALS STICK CHAMPION

How to Construct the Winner of the 1941 Nationals Open Division Event Which Flew for 1002 Seconds on Three Official Flights

By ED LAMB

THE "Climber" was completed at 4 o'clock the morning of the 1941 Nationals at Chicago; however, it is far from being a ship that was "thrown together in a hurry." About a month before the Nationals plans were drawn up for the model and before my brother and I arrived in Chicago, the wing, tail section and propeller were completed; the fuselage was built the two nights previous to the contest. We believe that this model's outstanding feature is its tremendous climbing ability. At the Nationals it had one flight of over seven minutes and another of over eight minutes, before going out of sight of the timer's stand. On both of these flights it landed about ten miles from the field. The total for the three official flights was 1002 seconds. In evening flying, the plane has been averaging over three minutes a flight.

Construction

The fuselage is constructed of 1/8" hard balsa; the easiest method is to construct the two side sections first. Cut the longeron strips to right length and pin them on a board to the right shape, then cement in the crosssections as shown on the plans. After both sides are completed and identical, cement in the top and bottom crosssections, starting at the middle and working toward both ends. After all the crosssections for top and bottom have been inserted, glue in the braces and 1/8" sheets as shown. The tail section is detachable and should be constructed separately.



Lamb and his model before the contest

The wing has an area of 200 square inches and is built in the usual manner. The three center sections are made in one piece and the two wing tips made separately. After the center section ribs have been cut and sanded to the same size, place them in position using the leading edge of 1/8" square balsa and the trailing edge of 1/8" x 3/8" balsa as supports. Glue them in firmly and then cement the top spars (1/16" x 3/32") and bottom spars (1/16" x 1/8") in position. After the spars are firmly cemented, cut the sections apart as



The national champion launches his winner

shown on the plans and recement them at the proper dihedral angle.

The wing tips are constructed in a similar manner except that reed is used to round the wing ends. If the reed does not bend easily, soak in warm water for a few minutes. After the tip sections are completed cement them to the other sections at the right polyhedral angle. The tips should be 5 1/4" above the level of the center section. To give added strength to the wing glue in gussets along the trailing edge as shown.

The stabilizer is constructed in a manner similar to the wing; we suggest making each half separately and then cementing them together at the right dihedral angle. The tips should each be 7/8" higher than the center of the stabilizer.

The rudder is constructed by first cutting the outline pieces from 1/8" flat balsa and cementing them in position. Then glue in the ribs making sure the camber is on the left side.



It soars steadily on the slightest thermal

The ribs are also cut from 1/8" flat balsa. After they are firmly in position glue in the spars, which are 1/16" square balsa strips.

The propeller is carved from a medium-hard balsa block 16" x 2 1/4" x 17/8". Cut the block as shown on the plans and after both blades are cut down to the desired shape, saw out the center section, 13/8" long, replacing it with the same length piece of hard balsa. After the blades are cut apart check them to make sure both are identically the same weight and shape.

The flying success of your model will depend largely on the propeller so make sure that the pitch is the same for both blades. After the blades have been sanded smooth and hinged to the center section give them about six or eight coats of clear dope, sanding down with pumice between each coat.

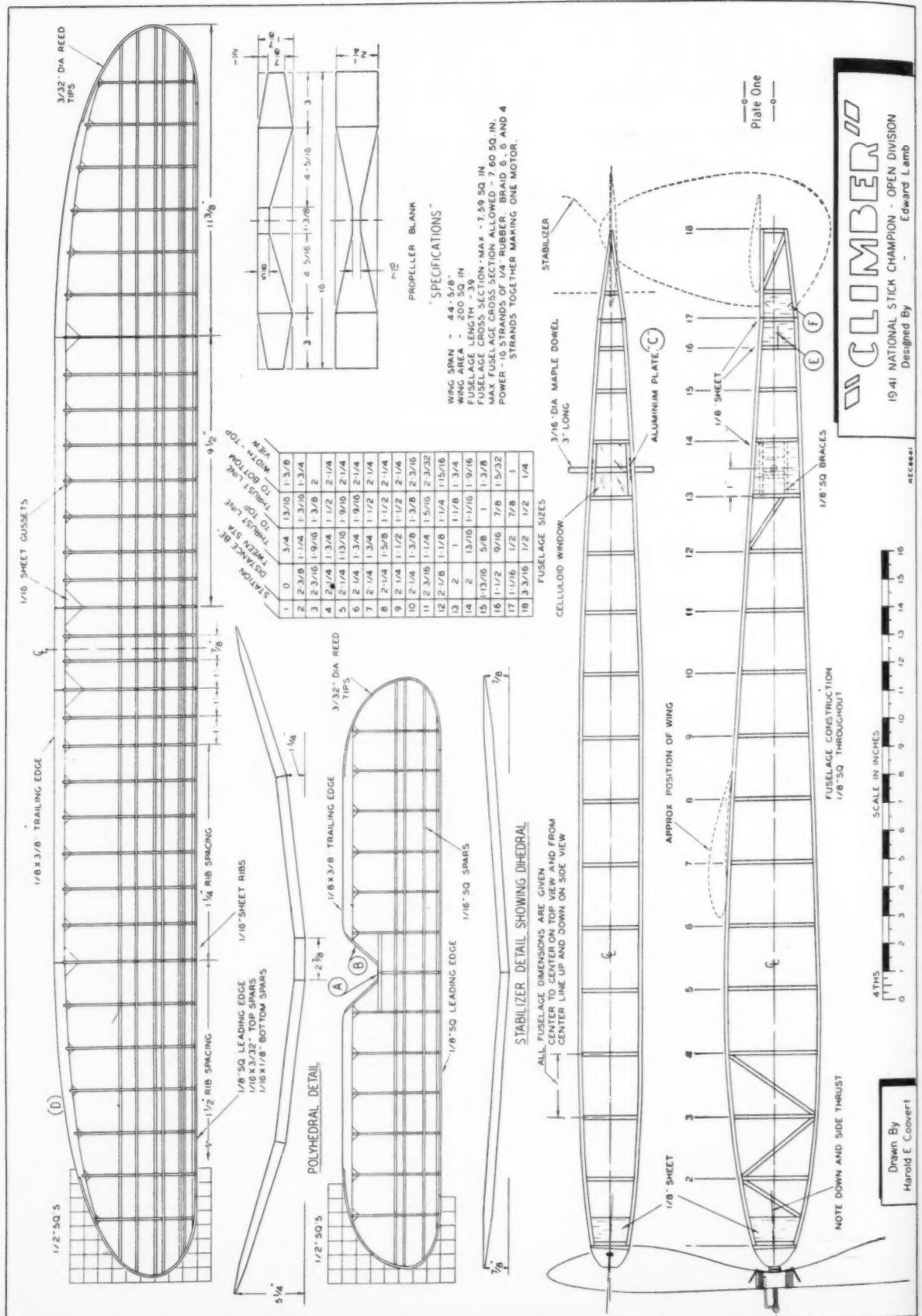
The fuselage is covered with gas model Silkspar; the wing, stabilizer and rudder with tissue. After the parts are papered, water dope and then apply three coats of clear dope.

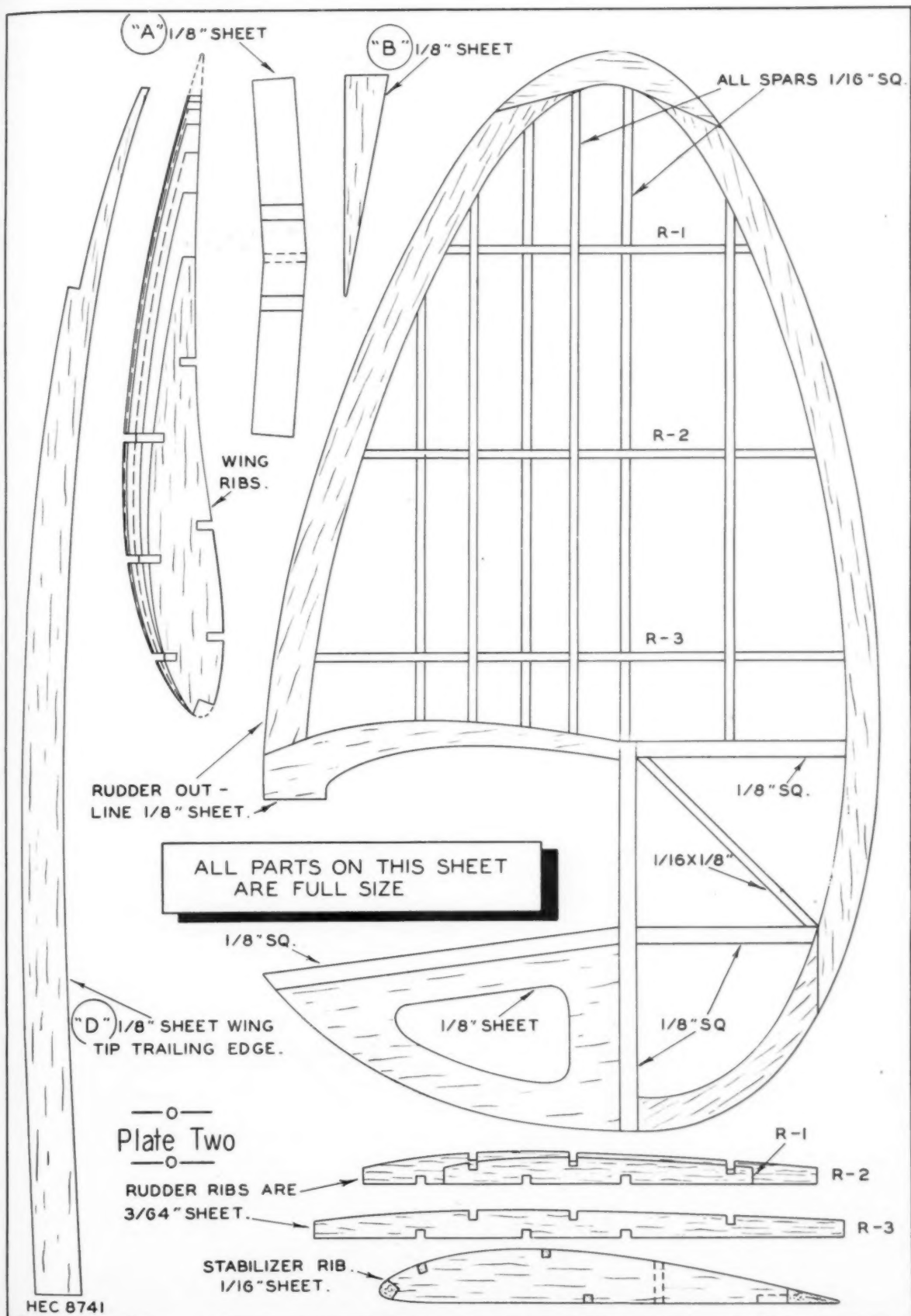
Flying

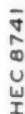
If the plans for the model have been followed closely you should have little trouble in adjusting the plane for flying. First test the position of the wing by gliding. If the plane dips, move the wing back slightly; if the glide is too steep, move the wing forward. After a satisfactory glide has been obtained give the motor about 100 turns to test the climb. It may be necessary to insert either side or down thrust to get the proper climb and turn under power. The plane should climb and glide to the right and in adjusting the circle try not to have it glide in circles of over 250 feet in diameter, as a plane turning in a small circle will stay in sight longer.

If the instructions have been followed carefully and care has been taken in building the "Climber" it should be a consistent contest winner for you. Good luck!









MODEL DESIGNING SIMPLIFIED

IN PAST articles complete proportions of a simple contest gas model were established, as well as the size of its various units. Also the procedure of designing a scale gas model was outlined. Designing an original plane not only makes it possible to work out original ideas but also provides a greater possibility of becoming expert in design.

Consequently the next and final steps in designing the simple contest model will now be explained.

Though the proportions of the plane itself have been established the design of a most essential, but in a sense auxiliary, flight factor has not yet been undertaken. It is the propeller. This functions to drive the plane, giving it sufficient forward speed to create wing lift greater than its weight. The forward pull (or push) is called "thrust." The propeller develops thrust in the same way the wing generates lift: by means of air reaction on moving surfaces set at an angle to the direction of motion. So basically a propeller is a combination of one or more blades (or wings) radiating perpendicularly from a central hub. The whole combination rotates about the hub axis.

Every propeller must have four basic qualifications: 1- Blade angle: Angle of the blade chord line to plane of rotation. 2 Pitch: Distance a propeller will move forward in one revolution when blade chord is parallel to its helical path (without slip). Expressed mathematically it is equal to the tangent of blade angle at the tips times π times diameter; or $P = \tan \text{blade } \angle (\pi D)$. 3. Diameter: Diameter

How to Design an Efficient Propeller for Your Gas Model—Selecting the Proper Pitch for Any Given Speed of Plane

By CHARLES HAMPSON GRANT

ARTICLE 13

of circle described by a blade tip as the prop turns on its axis. 4. Blade area: Total area of one side of all blades (equivalent in function to wing area). From a standpoint of effect, propellers differ only in respect to these four design factors. Their relative values depend on engine and plane speeds.

Many modelers believe that any propeller which the engine turns at maximum speed is satisfactory. This is a grave misconception and results invariably in low flight efficiency; much less than the plane's maximum capacity.

Every propeller must meet the specific requirements of the individual plane on which it operates. Planes of different design require different propellers if the maximum amount of thrust is to be obtained *when in flight*.

This introduces a vital consideration. The propeller must give maximum thrust at the plane's normal flying speed, NOT when it is *resting on the ground*. Thrust delivered under the latter condition is called *static thrust* and is absolutely no measure of the propeller's efficiency or its adaptability to any particular plane. Some propellers deliver a high static thrust but very little thrust when flying because the plane's flying speed is not coordinated with the propeller's potential forward

speed. (Speed forward when there is no slip.) These two speeds must have a definite ratio.

To give thrust the propeller blades must pass through the air at a positive angle as they revolve, if thrust is to be obtained; just as a wing must have a positive angle of attack if it is to give sufficient lift. Therefore it is obvious that the potential forward speed of the propeller must be greater than the plane's flying speed. In other words the propeller pitch speed must be greater than plane speed. The pitch speed is potential forward speed; the product of the propeller pitch times the revolutions made per minute—pitch being the distance a propeller will screw itself forward in one revolution without slip.

Inasmuch as the propeller actually cannot go forward faster than the plane, it slips slightly, an amount equal to the difference between pitch speed and plane speed. The greater the slip, the greater will be the blade's angle of attack in flight.

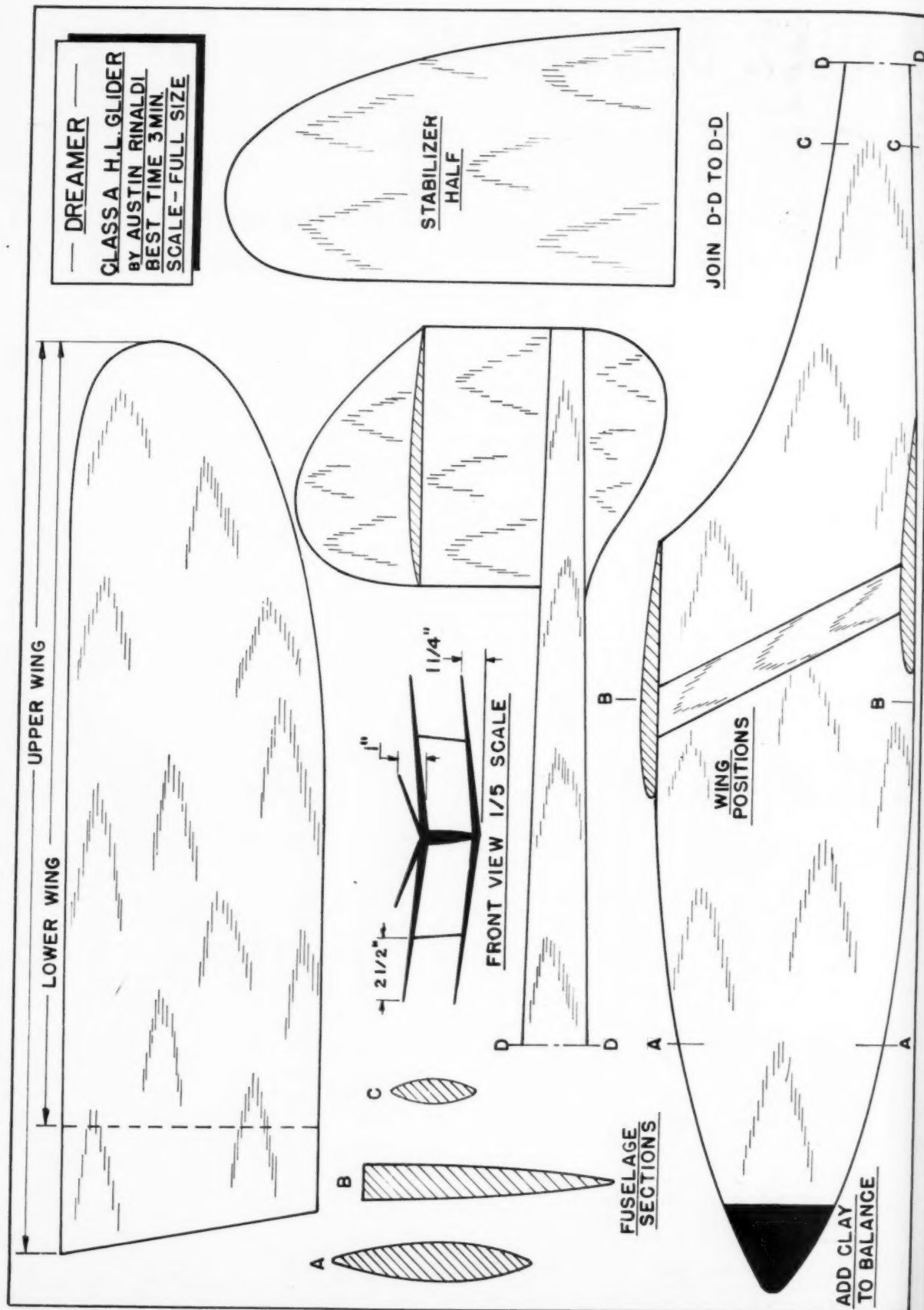
The problem is to design a propeller so slip will be just enough to have its blades pass through the air at the angle giving maximum thrust and least resistance to turning (torque). This angle corresponds to the angle of greatest wing lift-drag ratio, and is the angle between blade section chord line and the helical path followed by the blade as it revolves and moves forward.

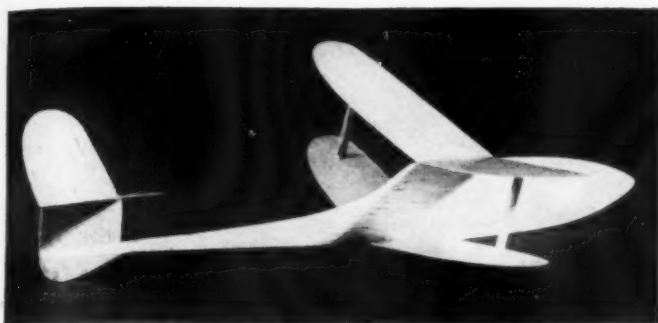
The most effective pitch speed has been determined by experiment to be about one and one-half times the minimum level flight speed of the plane.

Consequently the first step in designing a propeller for our simple contest gas model is to determine this minimum flight speed. Then the pitch speed and required pitch can be readily calculated; the second and third steps.

The minimum level flight speed is the speed at which the plane flies horizontally at the chosen angle of incidence, in this case 3°. It is dependent (Continued on page 59)

MINIMUM LEVEL FLIGHT SPEED AND PROPELLER PITCH TABLE									
FOR 3 DEGREES WING ANGLE OF INCIDENCE									
WING LOAD IN OUNCES		SPEED IN MILES PER HOUR						PITCH IN INCHES	
WING SECTION	CAMBER FACTOR	WING LOAD = 8		WING LOAD = 10		WING LOAD = 12		WING LOAD = 14	
		SPEED	PITCH	SPEED	PITCH	SPEED	PITCH	SPEED	PITCH
GRANT X	0.0885	17.70	7.07	19.60	7.92	22.75	9.10	23.40	9.36
" X 8	0.0777	18.90	7.55	21.35	8.54	23.25	9.30	25.00	10.00
" X 9	0.0692	20.00	8.00	22.50	9.00	24.50	9.80	26.50	10.60
" X 10	0.0623	21.20	8.48	23.65	9.46	25.80	10.32	28.00	11.20
" X 12	0.0533	22.90	9.16	25.50	10.20	28.10	11.24	30.20	12.08
" X 14	0.0457	24.30	9.74	27.50	11.00	30.10	12.04	32.50	13.00
" X 16	0.0397	26.50	10.60	29.50	11.80	32.35	12.94	34.85	14.04
" G 7	0.1135	15.70	6.24	17.60	7.00	19.20	7.68	20.75	8.30
" G 8	0.0994	16.75	6.70	18.75	7.50	20.50	8.20	22.20	8.88
" G 9	0.0883	17.75	7.10	19.80	7.92	21.70	8.67	23.50	9.24
" G 10	0.0795	18.75	7.50	20.90	8.36	22.90	9.16	24.75	9.69
EFFEL 400	0.0762	19.25	7.70	21.33	8.53	23.40	9.36	25.25	10.10
CLARK Y UP	0.0740	19.50	7.80	21.70	8.67	23.70	9.48	25.65	10.26
R. A. F. 32 LOW									
CLARK Y	0.0630	21.00	8.40	23.50	9.40	25.70	10.28	27.90	11.16
N.A.C.A. M.12	0.0538	22.80	9.12	25.50	10.20	28.00	11.20	30.10	12.04
CAMBER FACTOR FORMULA = $F_c = \left(\frac{3S_u + S_b}{4C} \right)$ MAY BE USED FOR ANY SECTION									
S _u = MAX HEIGHT OF UPPER SURFACE ABOVE CHORD LINE									
S _b = DISTANCE FROM CHORD LINE OF LOWER SURFACE POSITIVE CAMBER									
IF NO POSITIVE CAMBER, THEN DISTANCE OF NEGATIVE CAMBERED LOWER SURFACE FROM CHORD LINE IF BELOW CHORD LINE, IT IS A MINUS QUANTITY									
FOR 2 1/2° INCIDENCE MULTIPLY TABLE VALUES BY (1.045)									
" 2° " " " " (1.095)									
" 1 1/2° " " " " (1.153)									





The unique glider may be launched by hand or with catapult

NOW—THE BIPLANE GLIDER

A New Type Glider—Easy to
Build and a Remarkable Flier

By **AUSTIN RINALDI**

MODEL airplane builders! Here's the ship for you;—an improved biplane glider that catches the eye, both in looks and in flight. We know some of you don't believe in biplanes and are always building that same old monoplane glider; well, here is just the ship to prove to you that a good biplane will match any ordinary monoplane. It costs very little to build and can be made in one night.

This ship is also a honey for catapulting; just insert a hook on bottom of the body. The tail was especially designed for this purpose. When catapulted it climbs high and soars around, making good flights. Why not look at the plan and picture and start reading construction data?

Construction

To start building just trace wing patterns from the plan, which is full size, on a 3/32" sheet of medium hard balsa, cutting out for back sweep in top wing. Sand all four half wings to airfoil section given on

plan. Glue in dihedral of both wings, which is 1-1/4". Allow to dry and polish wings with clear dope or glider polish, whichever you prefer. Then cut out body, which is in two pieces on plan; join DD to DD for full size pattern of body, cutting it from a sheet of 3/16" by 2" medium hard balsa, sanding to crosssection indicated on plan. Cut out grooves for upper and for lower wing, making sure you glue both wings at 0° incidence. Body is also polished with clear dope or glider polish. When wings dry, cut out wing struts and sand to a streamline; then glue them between the wings. Refer to plan for their position. Next you cut the stabilizer from 1/16" by 2" medium hard balsa, sand to section as on plan and glue in dihedral in same manner as wings. The stabilizer dihedral is one inch. While this is drying cut the sub rudder and tail mount from 1/8" sheet. Sand to streamline and glue on body, then glue on stabilizer at 0° incidence; polish whole tail assembly. Wax

the whole ship for a good shine and finish.

Flying and Adjusting

Test glide the ship, adding clay to nose to balance it. When a long, flat glide is obtained launch the model. If you wish to catapult ship, bend a small hook out of .049 wire.

Well, that's all for now. We hope you will be satisfied with the performance of this model as we are.

Bill of Materials

- 1 sheet 3/32" by 2" by 36" for wings.
- 1 sheet 3/16" by 2" by 15" for body.
- 1 sheet 1/16" by 2" by 7" for stabilizer.
- 1 sheet 1/8" by 2" by 2" for tail mount and sub rudder.
- 1 ounce clear dope.
- 1 ounce cement.
- 1 piece .049 wire.

Academy of Model Aeronautics

A Division of the National Aeronautic Association

OFFICIAL MODEL AIRPLANE NEWS

Presented by **AL LEWIS, EXECUTIVE DIRECTOR**

A.M.A. Contest Board Swings Into Action

National A.M.A. Officers Elected—
Roberts Continues as President

THE Academy Contest Board has started to work on new regulations and indications point to few changes other than simplification and perhaps heavier gas models in an effort to prevent so many from flying out of sight.

The consensus of West Coast opinion as gathered at National Headquarters is that 120 ounces per cubic inch displacement and 12 ounces per square foot of wing area would be most acceptable. East Coast clubs, to a remarkable degree, seem to say 10 ounces per square foot of area and 100 ounces per cubic inch displacement.

A considerable controversy has been noticed in regard to the motor run; some leaders feel heavier models should be given 20 seconds to get off the ground, while others feel 15 seconds is sufficient. It is evident some sort of measure should be taken to prevent so many models flying out of sight and away from the contest sites.

The slate of officers selected by the Nominating Committee of the Academy was approved by the membership during a recent mail ballot, it was announced by Kendall K. Hoyt, Manager, National Aeronautic Association.

As specified in the Academy by-laws, the mail election was held under N.A.A. direction. The Academy officers are:

President: Edward Roberts, Philadelphia.
Vice-Pres., Dist. I: Willis Brown, Boston.

V.P., Dist. II: Irwin Polk, New York City.

V.P., Dist. III: Carl Hopkins, Clarksburg, W. Va.

V.P., Dist. IV: Ted Schindler, Langley Field, Va.

V.P., Dist. V: Jimmy Metchicas, Newberry, S. C.

V.P., Dist. VI: Carl Goldberg, Chicago.

V.P., Dist. VII: Stephen Corbett, Detroit.

V.P., Dist. VIII: Edward Burgdorf, Houston.

V.P., Dist. IX: Leo Rutledge, Wichita.

V.P., Dist. X: Irwin Ohlsson, Los Angeles.

V.P., Dist. XI: Harry Fosbury, Portland, Ore.

Sec'y.-Treas.: Albert L. Lewis, Washington.

The membership also overwhelmingly voted to make the several changes in the by-laws which were detailed on the ballot as well as enroll all gas and rubber model flyers as "associate" Academy members but with no voting power.

This last move has been held by model leaders as an extremely democratic gesture on the part of Academy leader members,

(Continued on page 32)





It is difficult to distinguish the model from a full scale plane. Slots give added efficiency and stability

The PARAGON takes Wing

It Looks Like a Large Plane and Flies Like a Contest Model—A Slotted Wing Gives Super Efficiency and Stability

By FRANK EHLING

HERE, for the first time, is a gas job that employs the use of wing slots to obtain the highest degree of wing efficiency and to increase stability.

Why use wing slots? That can be best answered by giving some advantages of wing slots; those used on this model were designed by your editor, Mr. C. H. Grant. This is the ideal wing section for the beginner, for while we do not claim this wing section to out-climb any others, it will certainly out-glide the rest. This is accounted for as the wing slot, when used correctly, will increase the efficiency of the wing section greatly and produce the extra lift desired by the builder who wants topnotch performance.

The stability gained by using slots is not to be overlooked as this ship was flown many times and then a change was made to shift the weights backward. To our surprise the ship's performance was almost doubled. To check this, the slot

was closed with the use of Scotch tape and again flown; then the ship that was as stable as an ocean-going liner was turned into a tricky little hard-to-fly ship. This was the final proof of our experiments. The wing slots also offer the designer the use of a shorter tail moment arm; this will be appreciated by the flier who wants his ship to recover as soon as the motor cuts. Also the ship soars more easily than one with a long tail moment arm.

When this model was designed, no thought of contest work was in mind; however, since completion it has proved to be a potential contest ship. This along with the appearance of a real plane has won the hearts of all who have seen it.

It has had over fifty flights, though taken to the field on

only three different occasions. The Paragon has lived up to its name in more ways than one: It is as stable as a giant clipper, with the zest of a pursuit ship, and a glide that can be compared with an underweight model, proving the effect slots have on model airplanes.

Powered with the new Bantam it makes
(Continued on page 32)



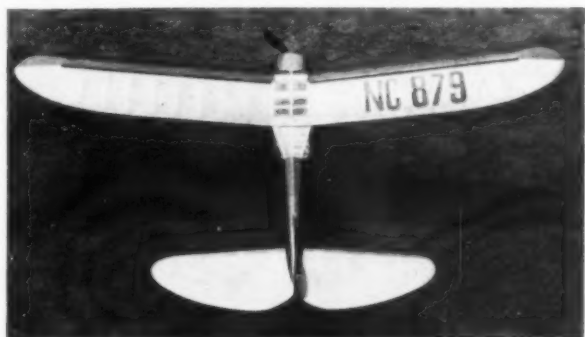
The box type body gives great strength



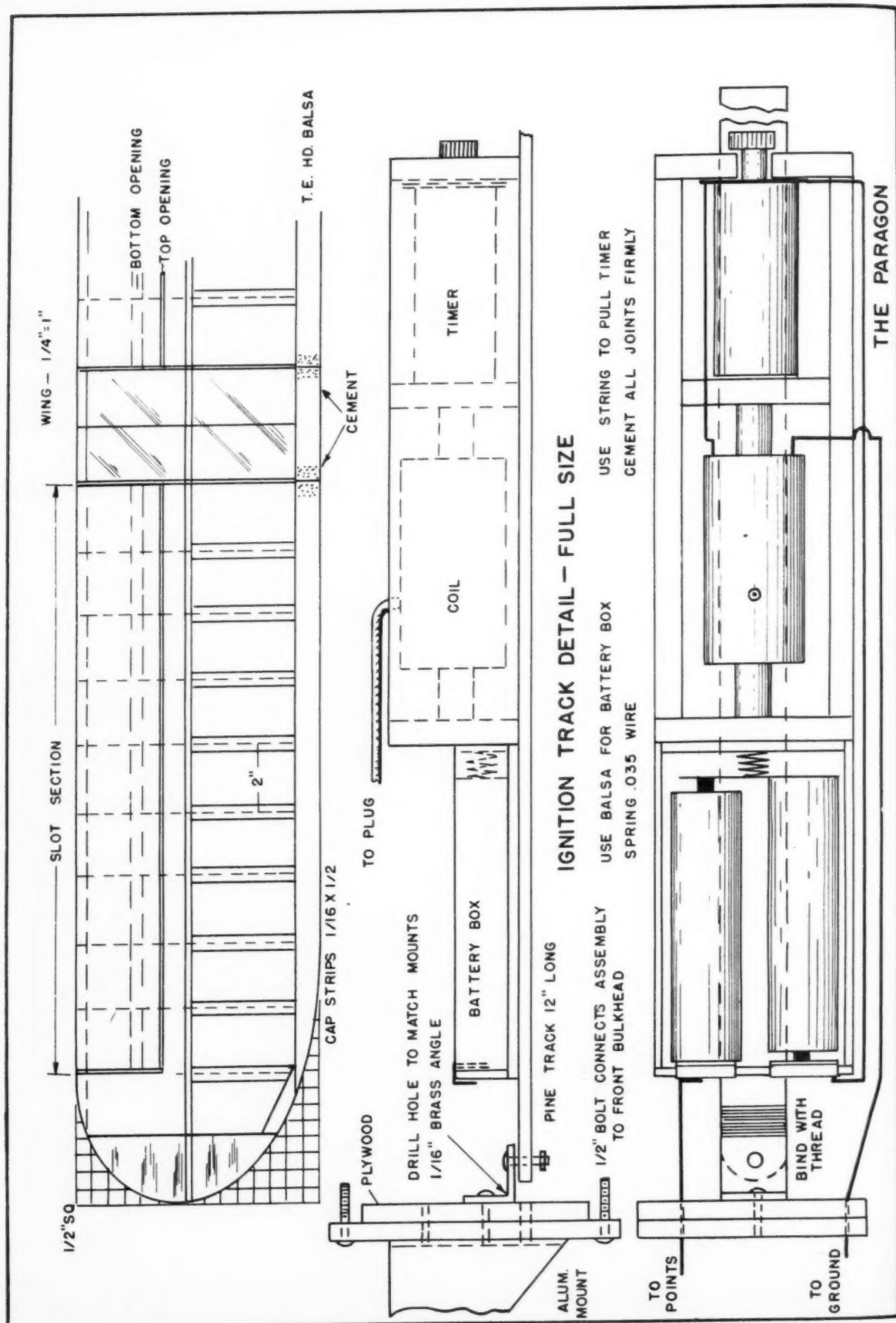
The Slot housing provides a strong wing spar

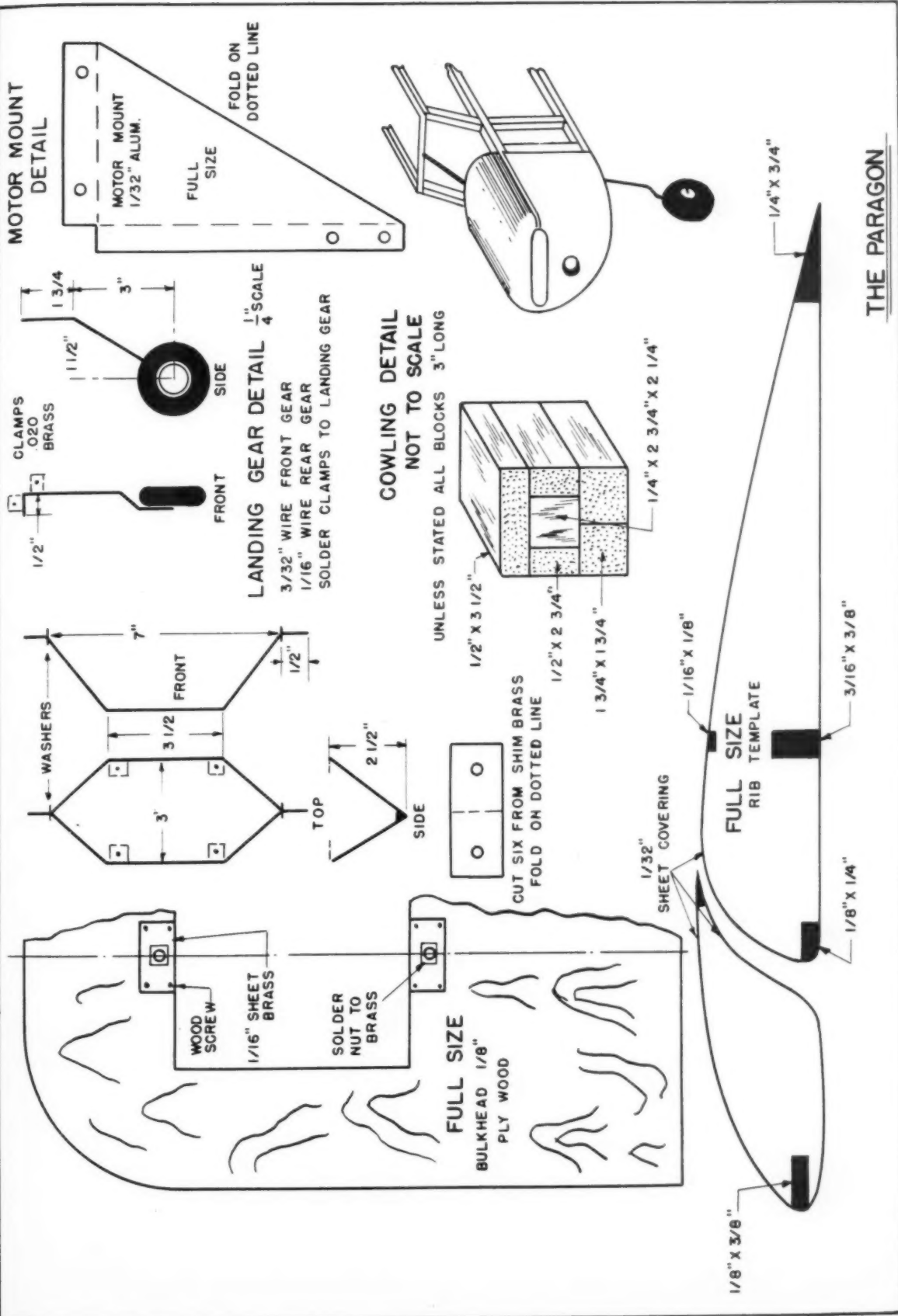


Here it gives evidence of its graceful proportions



The slot is clearly visible along the span of the wing



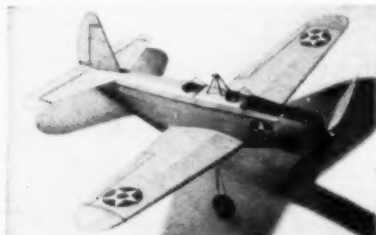




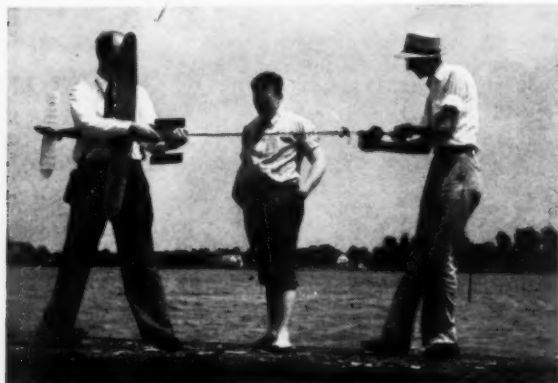
Charles Richberg launches his "supersticker"



Al Pardocchi put a beautiful finish on his semi-scale Meteor which he holds here



Allen Werber's flying scale "Howard"



Dick Simmons winds his hydro for a 56 min. flight

GAS LINES

AIR WAYS

NEWS OF MODELS AND BUILDERS FROM ALL PARTS OF THE WORLD

MODEL aviation has become organized to such an extent, during the past few years, that it is a question now whether or not the "life" of the sport, namely expression of original ideas, is going to be smothered with procedures, methods and restrictions of various kinds.

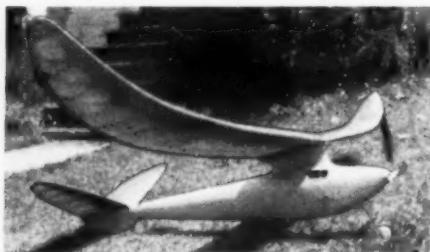
At present the rules are such that practically only one or two designs of ships are being flown, and most of these are not designed by the contestant but are merely being built and flown by him. The burning

and vital value of model aviation is the fact that it provides a means of putting ideas into dynamic and concrete form; it is a road for the imagination to the goal of realization. It provides an outlet for that urge to create.

Therefore it is with great misgivings that we look upon the present trend which focuses attention upon prizes one will get at a contest and upon the building and flying of ships, rather than upon design. This is prompted by allowing built-up commercial kits to be flown in all contests. Unquestionably these should not be cut out of meets entirely, but at least an event in every contest should be provided for those who wish to design, build and fly their ships and not only build and fly them; the former are an entirely "different breed of bird." They are the ones who inspired model aviation in its early days, have built it up and who have obtained something of great value from the original thinking that it prompts.

We believe donations of valuable and expensive awards attract those who are particularly interested in obtaining something of commercial value. If awards of lesser value, but of greater significance and import in respect to achievement, are given, those who are interested in the SPORT of model aviation will be drawn into the game. There are many of the latter type in the country and we think their appeal should be heeded.

Consequently MODEL AIRPLANE NEWS is contemplating organizing a Model Airplane



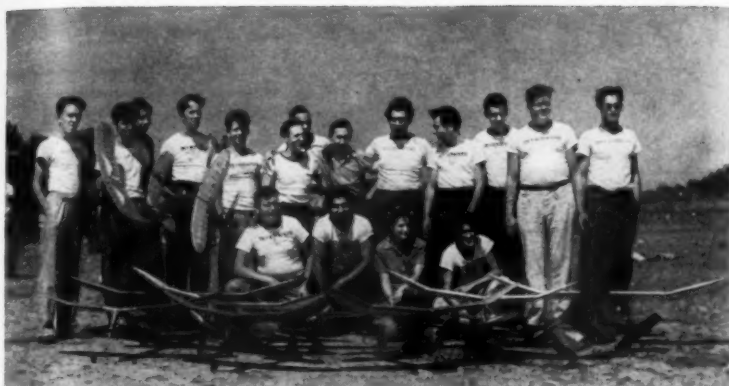
The most "soaringest" gas model ever built. It has an aspect ratio of 14.2; designed by Gene Baker



Something new; a triplane gas job



Jack Krenzler's hydro zooms over the spectators at Portsmouth, Va.



The Sky-Scrapers Club, one of the most active and well known Eastern groups



Druckman glides his scale Fokker D-8

(Right) The three first place winners at the Jackson model contest. L. to r: Clif Travis, Chas. Hauff and Richard Willard



Sportsman Association. (M.A.S.A.) We would like to hear from all those who believe such an organization would be helpful to model builders. If enough requests are received steps will be taken to form such an organization on a permanent basis. Let us hear from you so, through your ideas, we will be enabled to print the type of material and follow the editorial policy close to the hearts of the majority of builders.

Word comes to us through underground channels that a rule is being considered which states stabilizer area over 30% of the wing area is to be classified as wing area. Here we have another restriction. Are the rule makers not going in the wrong direction? Rather than tie down model building let us release it so builders may more freely give vent to their ideas.

Now we take pleasure in presenting some of the original features in model planes that have come to us this month. Picture 1 shows Charles Richberg of St. Augustine, Florida, launching his 170 sq. in stick model. This is one of the most beautiful jobs we have seen in a long time. The high aspect ratio not only provides high efficiency but

because of the small chord increases stability. We regret that more information cannot be given about this model; perhaps Richberg will take pity on our readers and let us hear from him, telling us about his ship.

Picture 2 shows Al Pardocchi of the Sky-Scrapers Club, Brooklyn, N.Y., with his semi-scale Grant cabin model. Pardocchi built this ship chiefly because of its unusual appearance. It has a very fine finish, painted in red and yellow. There is an interesting history back of this model, not commonly known: It was designed originally as a prototype for a radio control target plane, but proved to have qualities excellent for a small sportplane. Plans now are being laid to build a larger model and we hope eventually the design will "grow up" to full scale from model form.

Picture 3 shows a high aspect ratio gas job, built by Phillip Baker and designed by

(Continued on page 30)



Kerson Bologh with his Ryan gas scale job



"Scotty" Murray now flies for British



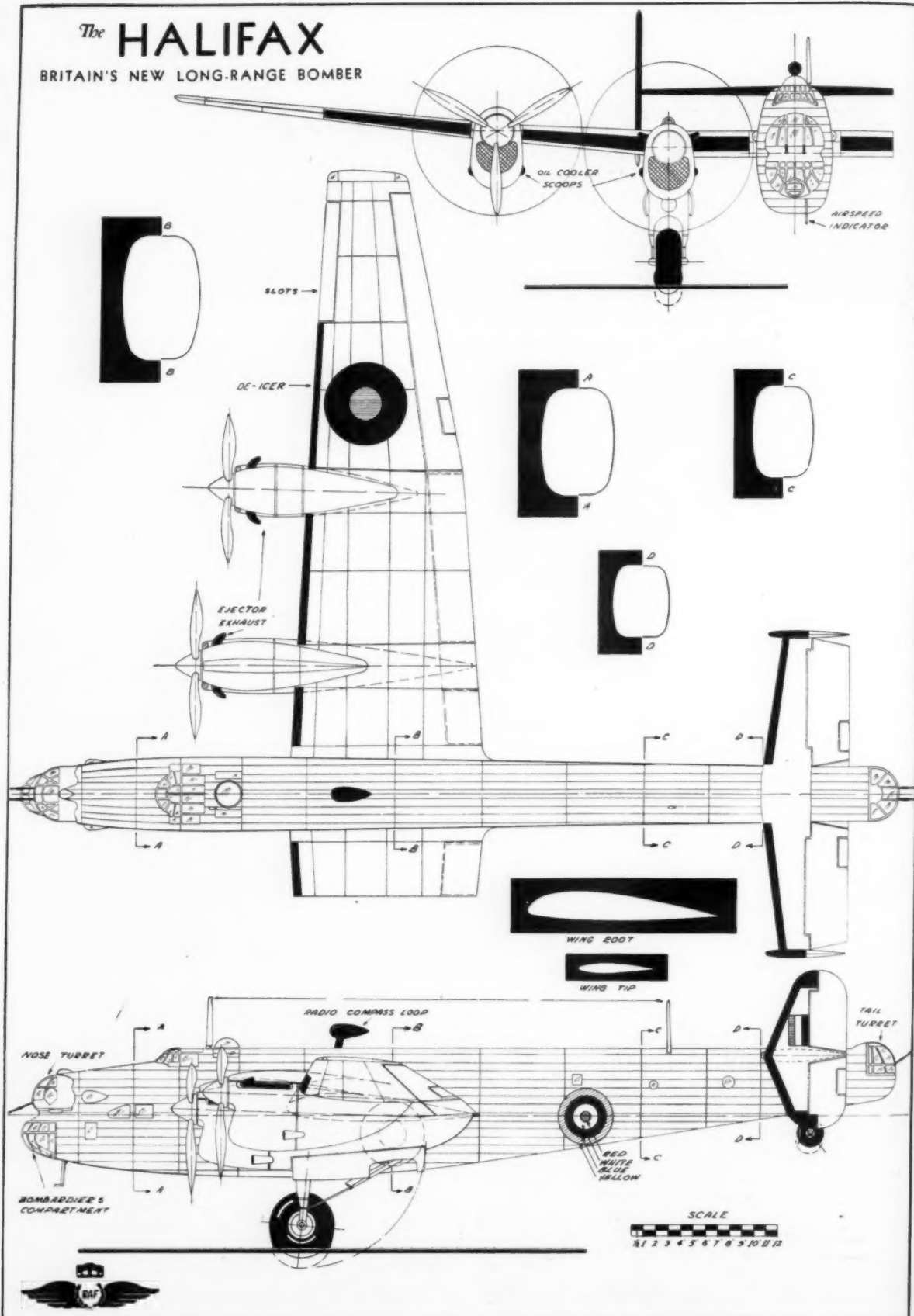
Ken Fisher with his ship of unique design

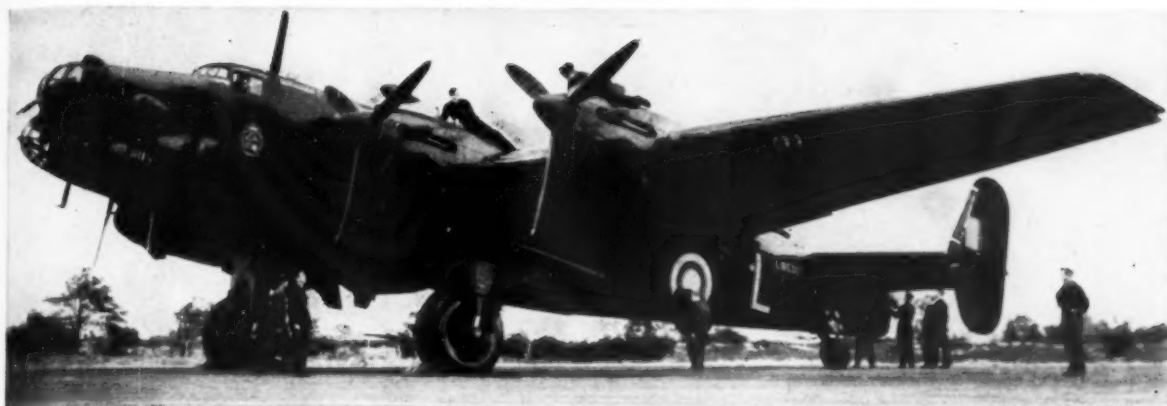


Here is the Giesson family; all are model fliers

The HALIFAX

BRITAIN'S NEW LONG-RANGE BOMBER





The Handley-Page Halifax, 99 feet in span, bristling with guns, is being serviced for a flight over Germany

ENGLAND'S WINGED "BIG BERTHA"

The Plane on the Cover

By ROBERT MCLARREN

ENGLAND'S Halifax is the spirit of British democracy and peaceful way of life. It is the soul of tact, diplomacy and better outlook on the world's peoples. It stands for harmony and unity among democracies. It stands for loyalty to a belief, love of state and family, a hatred of all things evil or unjust. That is England's Halifax number one: Lord Halifax, the British Ambassador to the United States.

But England's Halifax number two is a far different thing. It stands for destruction, defeat of attackers, laying waste of the enemies' fields, cities and centers of manufacture. It is as undiplomatic as a bee-sting, as tactful as reveille at a sol-

dier's camp and as democratic as an uncontrolled fire. For England's Halifax number two is the Royal Air Force's first and thereby latest four motor long-range bomber.

Perhaps we have taken great liberties in allotting number one to the British Ambassador. Perhaps England's most important Halifax is their bomber which is advancing the cause of British democracy in a much more concrete and certainly more obvious and understandable manner than the work of Lord Halifax; it is a very definite question whether the work of the diplomat exceeds in power

and lasting value that of the roaring cannon and the clash of steel. Hitler has answered that question in a very definite way for the time being, for all you and I know, permanently. And so, likewise for the time being, the Handley-Page Halifax, our Plane on the Cover this month, is the Royal Air Force's ambassador of peace and good will—by force!

Handley-Page, Ltd., of Cricklewood (suburb of London) is the oldest incorporated aircraft firm in England and, con-

(Continued on page 50)

AIR YOUTH OF AMERICA

News of Importance to Modelers



KEEP 'em Flying is the slogan that the U. S. Air Forces have adopted to focus public attention on the need for men and materials for Uncle Sam's growing sky fleet.

Start 'em Flying has been taken up as a catchy variation of the air forces slogan, expressing the need for training youth through junior aviation and model aeronautics.

Credit for originating the phrase should go to Bob Sommers and his lively crew of St. Louis model builders. It's a slogan that deserves being used as expressing the objectives of the entire aviation movement. Local clubs, national organizations,

and members of the model airplane industry should help out by giving the slogan all the publicity possible. It can do a great deal to gain valuable attention for the educational value of model aviation.

AYA Area Leaders Named

Area Directors who will represent Air Youth in various sections of the country

have been named by the Air Youth National Council, it is announced by Ernest Gamache.

"In recognition of the outstanding service to junior aviation and the development of model airplane building and flying that has been made by the leaders in the field, Air Youth is seeking to establish closer

(Continued on page 48)



An all-girls class in model building under leadership of Leo Rutledge has applied for an Air Youth Club Charter, the first girls' club in Kansas if not in the U.S.A.



It has sleek realistic lines, just like its large counterpart



A wide blade prop gives plenty of climb

Building A Flying NAVY SCOUT

**A Realistic Fine Performance Model
of Uncle Sam's New Navy Gun Spotter**

By EARL STAHL

NEWEST scout-observation plane being produced for the U.S. Navy is the trim little Curtiss SO3C-1. As such it is designed to perform the various duties re-

quired of planes operating from cruisers and battle-ships. It can be used either as a landplane or seaplane, its chief function, however, being that of a catapult launched seaplane.

Frequently referred to as the "eyes of the fleet," it is the military mission of these ships to direct the fire of battle-ships' big guns and conduct long range scouting activities in search of enemy surface vessels and submarines. In addition to these tasks the "S-O" planes lay protective smoke screens around friendly naval craft and even engage in light bombing and fighting activities.

In design the SO3C-1 is a two-seater, mid-wing monoplane. An

inverted, air-cooled Ranger 12 cylinder engine of 520 horsepower is installed. With the exception of the fabric covered tail surfaces, construction is all metal. As a landplane, the ship is equipped with a fully faired, non retractable landing gear; when being used as a catapult launched seaplane, a large single main float and two small wing tip floats are installed.

Compared with modern shore or aircraft carrier based aircraft, the perform-

(Continued on page 42)



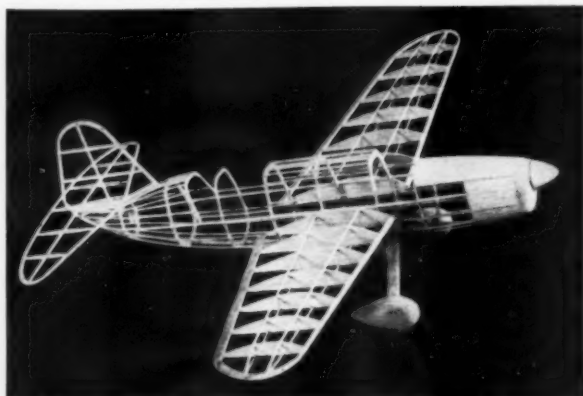
Cockpits for pilot and observer are enclosed



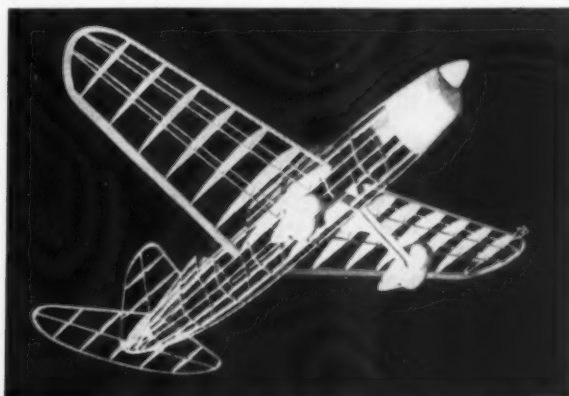
Large tail surface gives steady flight



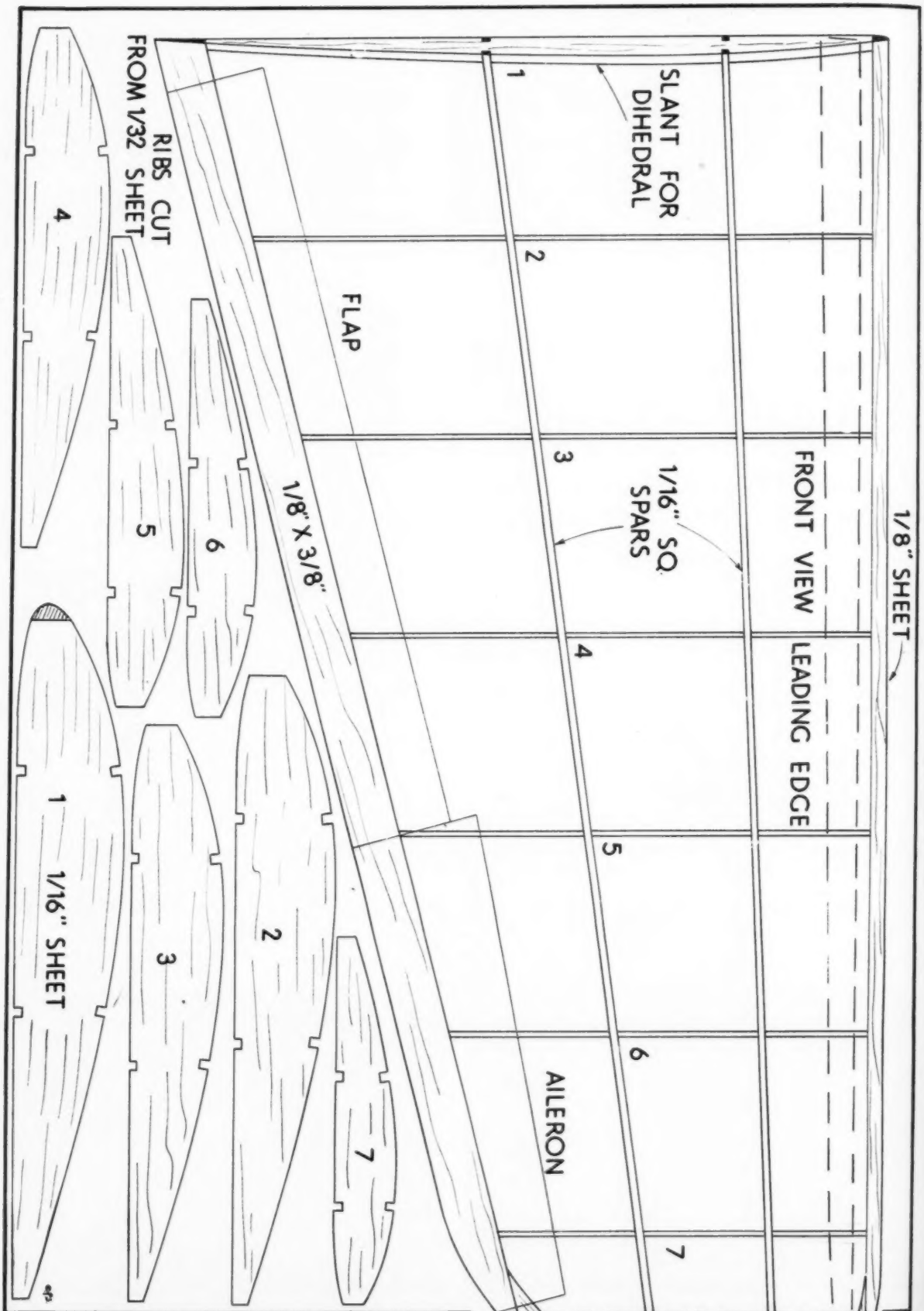
In full flight—most realistic

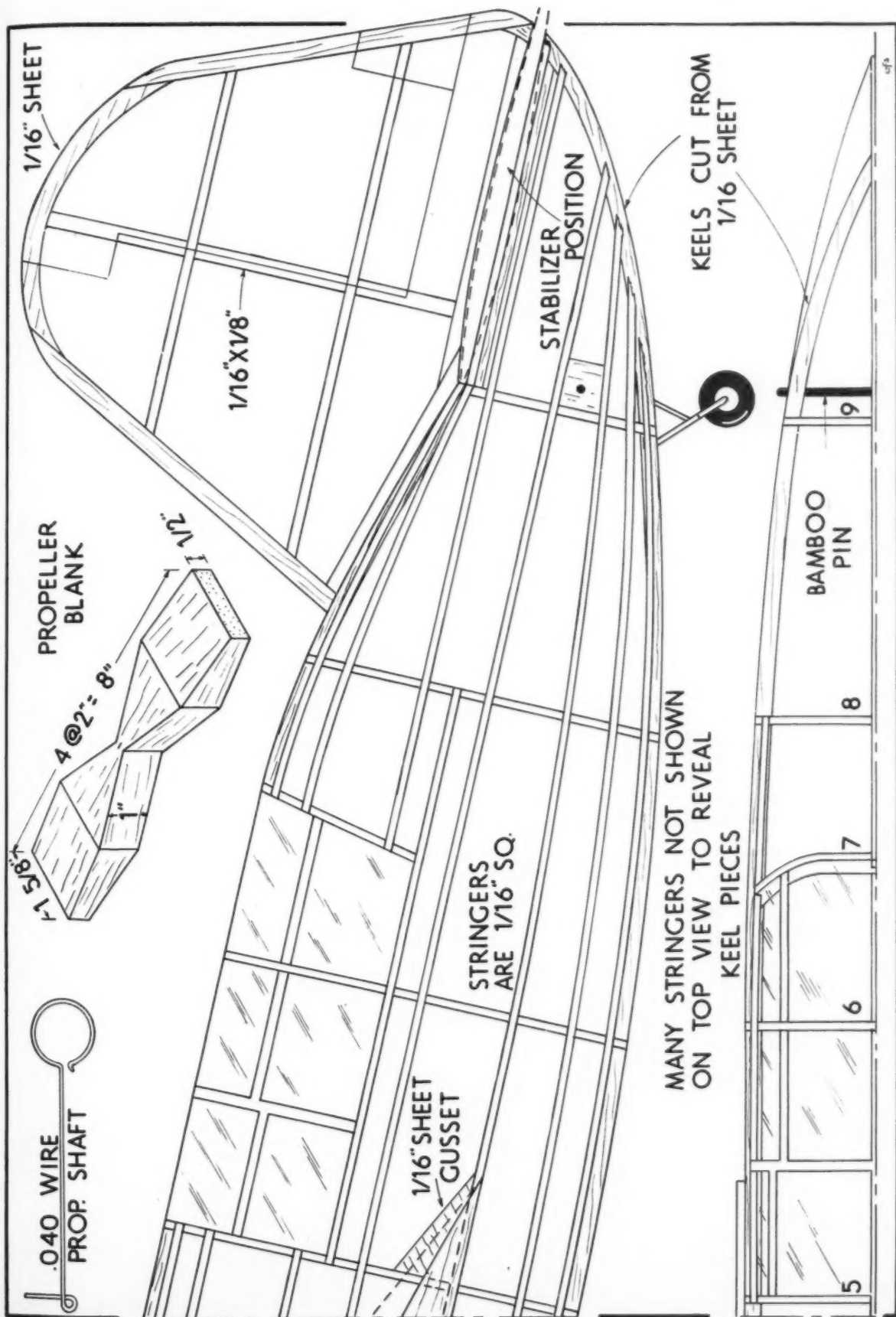


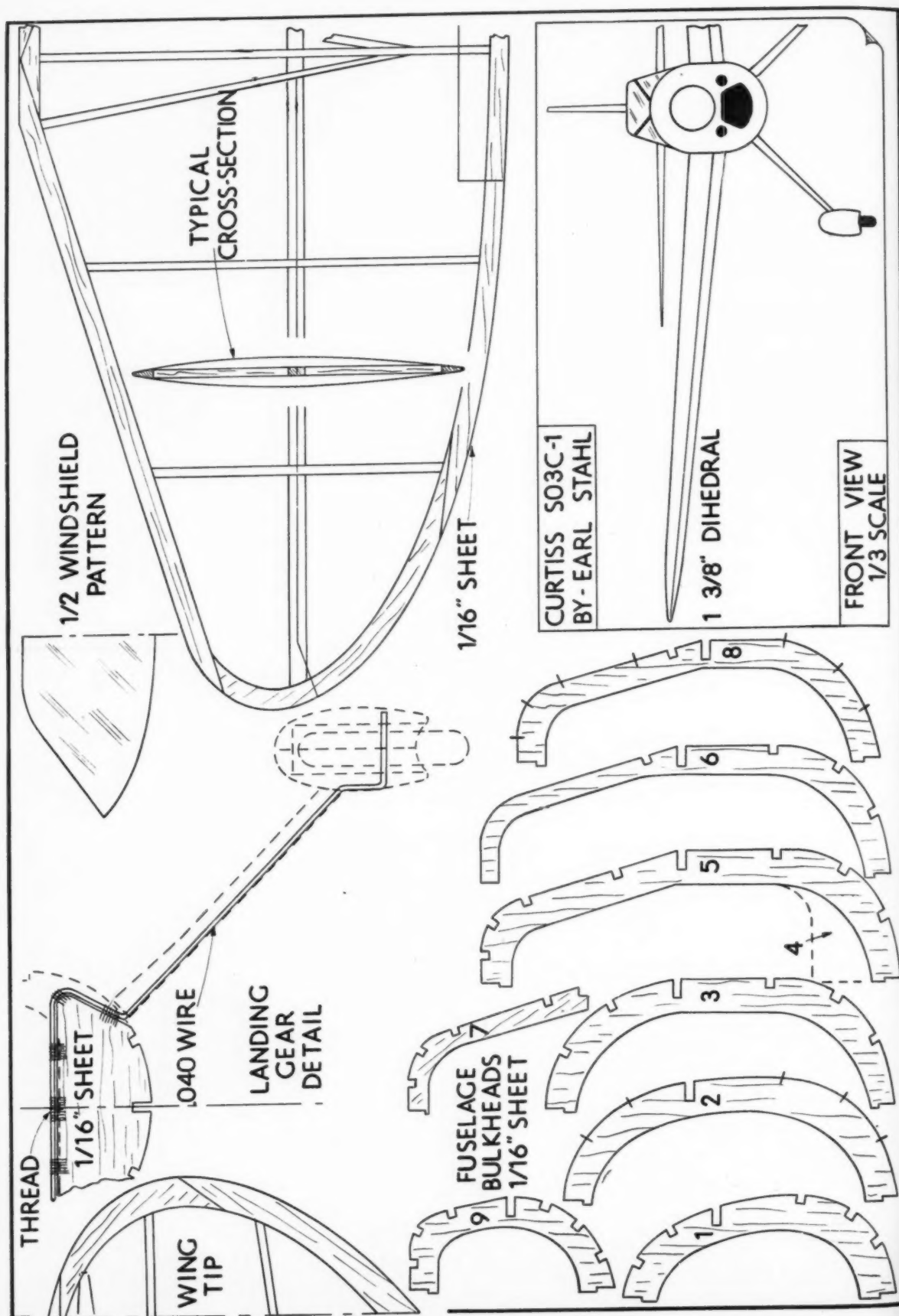
The frame is sturdy, light yet flexible, to withstand shocks



The reinforced nose helps to prevent damage







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for big, new 1942
Megow Catalog of
Model Airplanes,
Ships and Railroads.

Megow

PHILADELPHIA, PENNSYLVANIA

New War Wings Over Europe

(Continued from page 8)

has a ceiling of 38,000 feet. Its armament includes 4 M/G 17 machine-guns and two 20 mm. cannon. Three full squadrons of this design are now in service, with production well under way.

Another Focke-Wulf product is the FW-198 (MODEL AIRPLANE NEWS, May, 1941 issue) single seat pusher fighter with a top speed at 19,680 of 375 miles per hour. Of new out rigger tail pusher design, this odd ship has a span of 41 feet, is 31 feet 6 inches long. It has a gross weight of 7188 pounds and ceiling of 34,400 feet. It climbs at the rate of 2775 feet per minute (compared to 6,000 ft./min. of our latest interceptor) and has a range of 590 miles at cruising speed.

The new Heinkel He-121 is one of those super-fast streamlined seaters turned out by Professor-Ing. Ernst Heinkel. It is a cut-down version of the ill-fated He-113 and has even more power in the nose, the new 1,375 hp. Daimler-Benz. A top speed of 425 miles per hour has been quoted but in light of the He-113's landing speed of 110 mph, it is certain to be another killer-ship for untrained Nazi pilots.

The Messerschmitt Me-115 is a development of the deadly Me-110; it has slightly larger motors and a new-type wing-slot-flap combination to insure stability.

Another Messerschmitt, the Me-119, is still in the design stage and is said to be in the 425 m.p.h. category with the new Heinkel. Possibly a development of the Me-109, this new ship is a single engine single seat fighter with a new high-lift wing section which cuts the span to only 22 feet, as compared to 32 feet of the 109. Four cannon are carried and the big Daimler-Benz 1,375 engine is used.

CONVOY FIGHTERS—This category denotes the long-range twin engine fighters, latest of which is the Heinkel He-119 and the Henschel Hs-133 monoplanes. Both are fitted with the Daimler-Benz 1,375 horsepower liquid-cooled engine; both carry three men. The Henschel is a lightweight knock-out type of convoy fighter whereas the big Heinkel packs six aero cannon in its wings, necessitating extremely heavy fittings and a thick wing contour. Another lightweight ship is the Siebel Fh-301, only one of which has been built (suggesting an inadequacy in design or construction); it employs two new Argus As-510, 980 hp. motors.

BOMBERS—Not too successful with the lightweight bombers she has been employing to date, Germany is now in production on three new heavy four motor types of the 10-12 ton variety. The Focke-Wulf Fw-200K is a development of the famed "Condor", as sleek a big plane as was ever built. Known as the "Kurrier", this giant is powered with four B.M.W. 132Dc nine-cylinder radial air-cooled engines of 720 horsepower each. It has a crew of six, and Germany's first power-operated turret, a four-gun variety on its upper deck. There are four other gun emplacements, two in the big belly bomb bay. This giant has a range of 2300 miles with a 6,000 pound bomb load. The huge Junkers Ju-89 four-motored giant has been improved and now, as the Ju-96 is a formidable destroyer of

the "Flying Fortress" class. Germany has not been able to get the speed from its heavy bombers that we have and this giant has a top of only 265 miles per hour. However, its disposable load of more than four tons is a terrific amount of destruction.

(Continued on page 70)

Gas Lines

(Continued from page 21)

Gene, his brother. The Bakers live at Seattle, Wash. Gene is one of those individuals fast becoming rare—who never builds a ship he doesn't design himself. The picture reflects this principle. This procedure is one of the finest gas jobs we have had the pleasure to print. The aspect ratio of 14.2 makes it a beautiful soarer, responsive to the slightest updraft. General specifications are: Span, 9 ft. 3 in.; Area, 6 sq. ft.; Wing section, Grant X; Stabilizer airfoil, Clark Y; Motor, Inverted Brown "B" with extended prop shaft. It also sports a one wheel retractable landing gear. Total weight is 3 lb. 3 oz. The motor mounts an 18 in. single blade folded propeller. Baker says the performance is amazing and will always equal the climb of any Class C plane, and better than that of any other gas job regardless of class. Other interesting features are: Curved-up dihedral tips, "V" stabilizer which acts as both stabilizer and fin, highly streamlined fuselage. We cannot see how it is possible to design a more efficient gas model than this one.

Allen J. Werber of 10 Daniel Road, Ladue Village, Mo., sends us picture 4 of his flying scale Howard Trainer built from plans in M.A.N. The plane was originally designed by Mr. Struhl; Mr. Werber says he has built every one of Mr. Struhl's plans published in MODEL AIRPLANE NEWS and has had them all fly most successfully. This little ship has made repeated flights over a long period of time.

Here we have a plane, picture 5, built by another young man who likes to put his ideas into concrete form—or should we say balsa wood form? It is a triplane gas model built by Varris Takesian of 20 Central Street, Haverhill, Mass. This is the first triplane gas model we have ever seen. We regret Takesian doesn't tell us more about its performance; nevertheless this should fly well and with excellent stability. From this and other pictures sent us it can be determined that the plane is well proportioned. We would be interested in hearing from those who would like to build such a triplane model.

Not long ago the Middle Atlantic States Hydro Contest was held at Portsmouth, Va. Bruno March gave us the highlights in our September issue; however, no pictures were then available. Now here are a couple which may be of interest. In picture 6 you see Dick Simmons with his Class D Korda for which he designed floats. The ship went aloft for a flight of 56 min. Someone asked if Simmons did not have the floats filled with helium; by the way, this is an idea, namely, a dirigible-hydro-airplane model!

Picture 7 shows a dramatic moment when Jack Krenzler's gas job made an R.O.W. takeoff and climbed up over the

crowd. You will note many are in bathing suits; these were donned by contestants so that they could wade out in water waist-deep to launch their ships.

One of the most active clubs in the country and one whose members win consistently in contests is the Sky-Scrapers Club in Brooklyn, N.Y. Recently it held its 3rd annual championship on Long Island near Mitchell Field. The turnout was larger than any other contest in the East this year; over 200 modelers were registered as entrants and police estimated there were about 7500 spectators.

Picture 8 is a line-up of the club; all members are present except Carroll Moon. (And they say, like his namesake, he only comes out at night.)

This meet featured a unique event and one which is becoming more popular with every passing contest, namely, a gas flying scale event. Picture 9 shows Erika Druckman gliding his Fokker D-8, entered in the scale event. He took second place. The ship was a beautiful job and made some excellent flights. There were at least three models of the Fokker D-8 on the field, which placed 1st, 2nd, 3rd.

Another interesting ship was Ken Fisher's monocoque fuselage model with wing slots, shown in picture 10. This plane is an excellent design and the slots work beautifully, making it stable.

Picture 11 shows a whole family who attended the contest. They are "The Flying Giessons" of Jackson Heights, N.Y., including mother, father, and son. If this family builds model planes all at the same time we wonder who prepares the meals. Usually the art of model building captures the interest to such an extent that all other activities are excluded, including domestic ones.

Alden Mowry of Orange, N.J., was declared the Eastern Champ after a day of tough competition. Mowry took second in Class C and fourth in Class B to win the coveted awards of two trophies, a motor, several kits, cash vouchers and a subscription. He also recorded the best single flight of the day, turning in 11:15 min. in the Class C event.

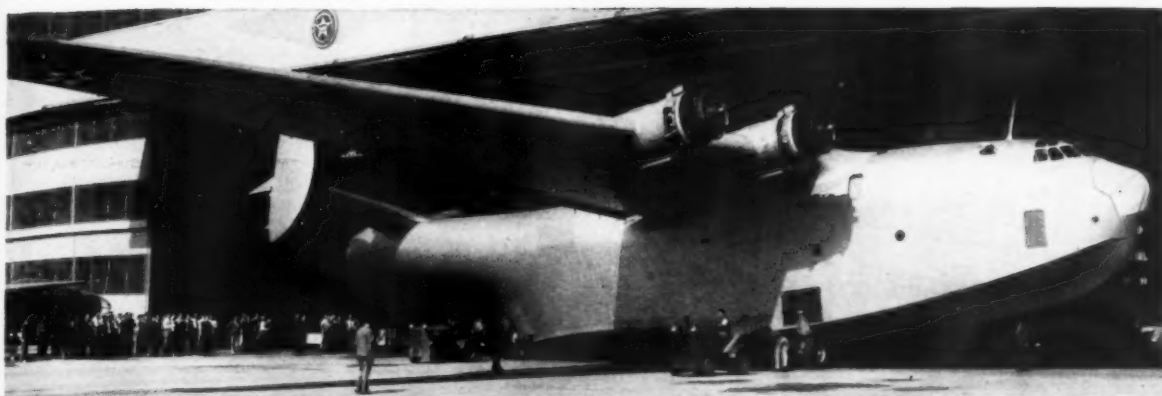
The gas flying scale event, the only one open to Sky-Scrapers, was won by Henry Osmer with a beautiful replica of a Fokker taken from plans which appeared in MODEL AIRPLANE NEWS. His ship took first in the beauty and fidelity half of the event and second in the flying half. Second was Erika Druckman, while Roger Hammer was third.

Other results were:

Class	Average	Best Flight
Class C		
George Hartman.....	5:13.3	9:40
Alden Mowry.....	4:38.1	11:15
Joseph Proctor.....	4:10.6	9:29
Class B		
Walter Waechter.....	2:54	7:25
William Kramer.....	2:23	4:38
James Slee.....	2:08.1	6:25
Class A		
Leonard Wilket.....	3:13.5	6:45
Fred Schmidt.....	2:58	6:30
John Findra, Jr.....	2:47	4:13

Miss Marion Weidele of the Kresge Club won the Ladies Prize for best time, her final average winning eighth in Class A. Her best single flight was 3:13.

(Continued on page 64)



The U. S. Navy's XPB2M-1, the largest flyingboat in the world. The 70 ton, 200 ft. span monster receives the finishing touches at the Martin Plant, Baltimore. It is powered with four 2000 hp. engines.

FOLLOWING recent FLASH NEWS policy we once again turned inquiring reporter and asked Donald Douglas, world famed designer, for words for MODEL AIRPLANE NEWS readers. After stalking him for well over a week we finally cornered him in, of all things, a tailoring shop! We posed one question: "What promise of permanence is there to a young man entering the aviation business today?"

As one of the world famous Tartaglia Brothers chalked, measured and tailored Douglas' trim, well shaped figure, the designer said: "There is certainly an element of 'here today gone tomorrow' thinking in the minds of aviation workers. They seem to feel that this National Defense program will mushroom for a few years then suddenly falter and collapse. We think five years when we make a move out at the plant. We are planning on a five-year basis, hoping on a ten-year basis. Don't think for a moment that the end of the war in Europe will mean the end of our own preparedness program, because it certainly will not. I have always believed in the airplane primarily as a means of transportation, fast, comfortable and safe, and not as a means of destruction of fellow human beings. After this National Defense business slacks off there will be a boom in commercial aviation such as the world has never seen, for there will be more money in the pockets of those who want to fly. The wise aircraft designers know this and are preparing for it. The only groups which will really suffer will be the small sub-contractors, parts and machine shops. These businesses will be for sale for little or nothing and there is the real future of today's aviation worker, starting his own business and running it in his own way. The intelligent aircraft worker today is saving his money and planning for the future, and the end of this emergency program will be but the beginning of his, for then he will have hundreds of opportunities to invest his time, energy and plans in something concrete. Every great mechanical business today began in a small machine shop and a young man who owns a few lathes, punch and drill presses, has



Special To Model Airplane News

enough money to support a small payroll and who has a worthwhile product, from tooth brushes to airplanes, will find all the permanence he need ever ask for."

"But what about the aircraft companies?" Flash News asked.

"Naturally, many thousands of aircraft workers will lose their jobs as any man loses his job when the company no longer needs him. But the men we need we are going to keep, regardless of what happens in the next five years, or ten or fifty. No man who has made himself indispensable during this emergency will lose his job, for all aircraft companies have their programs mapped out for the next twenty or thirty years and this will consist primarily of building airplanes. Your question reminds me of a story I once read concerning a young man who was very much in love but who told the young lady 'The future is so insecure I am afraid it unwise to contemplate our marriage soon,' and that young man said that in 1566! Perhaps another young man will say those very words in 2066 or 4066!"

Two new planes serve to spotlight this month's news: the Northrop Flying Wing and the new (and huge) Martin flying boat. We have mentioned both of these ships before and now keep our promise to bring you more details as they were released. The Northrop has no definite size, as yet, since it is a basic design and may be constructed with any given wing span and weight. It is the first true flying wing to go into actual construction for the Government. It consists of a single thick, heavily tapered wing with a decided sweepback on both the leading and trailing edges. It is powered by two "pancake" engines buried within the thickest portion of the wing and driven by two propellers mounted on extension shafts to the trailing edge. The pilot is located in a small streamlined housing in the central portion of the "V" and there are two gun turrets out in the wings of the multi-gun power driven type. Small

scale models of this plane have been test flown extensively at Muroc Dry Lake, near Los Angeles, and the pilot, speaking of its speed, stated: "I still don't believe it!"

The Martin is a full scale development of the popular PBM-1 twin engine patrol bomber with the oddly placed rudders. This ship was only a flying scale model of the newer and bigger modification which has a wing span of two hundred feet, four two thousand horsepower engines and weighs more than seventy tons! It can carry 150 fully equipped soldiers and is known as the XPB2M-1. It has not flown yet, nor even been completed, but on the occasion of its being assembled and the necessity of its being moved outdoors for the job, the news and photographs were released. Once again, more information on these two ships in the future.

Douglas is now tooling up for a huge contract for giant DC-4 four-motored troop transport ships to be known in the Army as C-54. The huge planes will carry fifty fully armed (and parachuted) troops each.

The British Spitfire has had a face-lifting in its armament, its eight machine guns being replaced with only four machine guns and two rapid fire cannon mounted one in each wing. Wing-cannon are new for single-seaters but are proving their worth.

Pilot Officer William H. Nichols, 26-year-old American Eagle squadron pilot, has been reported a prisoner in Italy. This fact has brought about many conjectures on the part of military students in this country, insofar as Spitfires, with which the Eagle squadron is equipped, do not have the range to carry out activities in Italy and it is believed that Nichols was lost in Germany and has been sent as a prisoner to Italy, leading to the belief Italy is serving as a large-scale prison camp for German captures. It has long

(Continued on page 60)

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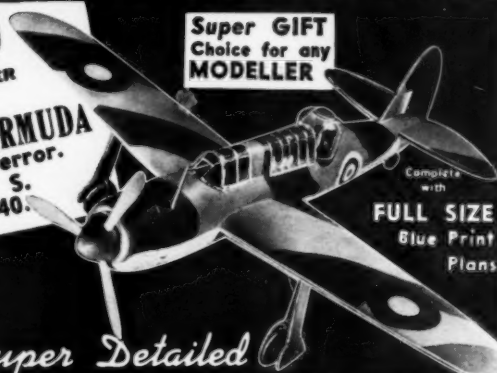
New! RYAN STM-2



BURKARD Models

BREWSTER-BERMUDA	17"
RYAN STM-2 (Above)	18"
STUKA Dive Bomber	23 1/2"
SPITFIRE	18 1/2"
BELL AIRACOBRA XP59	18 1/4"
GLOSTER GAUNTLET	16 1/2"
CURTIS HAWK	17 1/4"
CURTIS P-40	20"
MESSERSCHMITT Bf109	16 1/4"
GRUMMAN Navy F3F2	15 1/2"
HAWKER HURRICANE	18 1/4"
BOLTON DEFiant	20"
NORTH AMERICAN	20 1/2"

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The Paragon Takes Wing

(Continued from page 17)

an excellent class A job and it can also be flown with any class B engine as long as the total weight does not exceed twenty-two ounces to obtain the highest efficiency. (+ 3° inc. for Bantam) (+ 3 1/4° inc. for Ohlsson 23 or 19).

Wing

Start the wing by enlarging the wing plan four times the size shown. The wing slots are built first. This is done in the following manner: cut the ribs that are needed, the spar, leading and trailing edges and assemble these as you would build a regular wing. Cover this panel with 1/32" sheet and sand smooth. Then cover with tissue and dope. The rest of the wing proper is now built in the usual way.

Sheet the leading edge where the slot is with 1/32" sheet, then cover with tissue and dope. Tips are carved from solid blocks. Now cover the whole wing with Silkspan and dope. When this is finished the two wing parts can be cemented in place to form the slot, making sure the opening is as shown on the plan. The two panels are joined together with the

1/8" sheet gussets and a dihedral as shown on the plan.

Stabilizer and Rudder

This construction is as simple as can be; all that is required is to draw the plan full size, then cut the parts from 3/16" sheet and cement in place. This structure, when dry, is sanded to a streamline shape. The rudder is built in the same manner. When finished both are covered with Silkspan. The fillets between the rudder and the stabilizer are then carved to conform with the fuselage and cemented in place.

Fuselage

The fuselage is of simple box construction with a few formers on top at the rear of the cabin. A plywood bulkhead serves as an excellent place to bolt on the forward landing gear, which is bent to shape as shown on the plan, of 3/32" diameter music wire; the rear gear is bent to shape from 1/16" diameter wire. Solder the clamps in their proper place on the rear gear. The whole assembly is then bolted to the correct place on the plywood strips, which are cemented to the inside of the fuselage bottom.

The whole structure is covered with

1/16" soft balsa sheet; after this has been sanded smooth the whole body is then covered with tissue.

The ignition track is made in the following manner: Cut two formers from 1/8" birch plywood to the size shown. Cut the motor mounts from aluminum. Drill the required holes and bend to shape; they can now be bolted to the former. To the rear of the former the brass angle can be bolted; to this the tongue can be bolted, which is cut from pine. The box to hold the battery, coil and timer is made of hard balsa and this is held to the tongue with rubber bands till the ship has been thoroughly tested, then it can be cemented in place. The cowl is carved to shape, hollowed out to 1/4" thickness and covered with silk and dope.

Silk can be used for the hinge. Cut out for the exhaust opening; this will be determined by the individual engine that the builder uses.

The windows are now covered with a good grade of celluloid or something that will not wrinkle when it gets a little damp. The center part of the wing should also be covered with celluloid, as this is very helpful when you want to see inside the body without removing the wing.

Flying

Glide the ship till the glide is as flat and prolonged as possible. This will take a little time as this ship can be tail-heavy and still give a fair account of itself; this can be credited to the use of slots. After a satisfactory glide is obtained the ship may be flown; give it a ten-second run and watch how it acts.

It may be said that it will not be necessary to fly the ship in tight circles as it has not looped yet.

We hope you get as much fun from this ship as we did. We would like to hear from all who build it and will answer any questions that may arise; just send a stamped, self-addressed envelope to the author, care of MODEL AIRPLANE NEWS. Happy landings!

Academy of Model Aeronautics

(Continued from page 15)

since it has been the 50c and \$1.00 license fees of rubber and gas model builders respectively that have supported the Academy during its existence. This means the Academy now has a membership of more than 12,000 modelers and an "affiliated" club membership of more than 250,000 novice flyers.

Many excellent suggestions were made as to candidates for next year's election and it is anticipated the Nominating Committee will work considerably in advance of the general election.

The A.M.A. Mail Bag

JACQUE HOUSER, Mobile, Alabama:

"I can't remember mentioning it before, but the modelers of Mobile are in favor of putting the Nationals off until the latter part of August. With the present arrangement it is rather difficult for all the Gulf States to hold meets before the Nationals come in July. It seems to us that the Nationals should be the final big blow-up

READY DECEMBER 5th

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THE AUTHOR Charles Hampson Grant

received his training at Princeton Engineering School and Massachusetts Institute of Technology which led to designing U.S. army ships in World War I. His glider experiments and work with large planes as early as 1911 earned a coveted membership in the "Early Birds." For 20 years he has been the world's foremost model flying authority, and for the past ten years has been Editor of MODEL AIRPLANE NEWS—all of which is reflected in this, his life's work.

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How large should the stabilizer be?
What is the center of gravity and how can it be found?
How is lift generated and calculated?
At what angle should the stabilizer be set?
How can a plane be made laterally stable?
How big should a model plane be? How much power should it have?
What makes a plane nose dive?
What size propeller should be used?
How can blade area be calculated?
What pitch is required for a given flying speed?
How do gas model propellers differ from rubber props?
How much rubber should be used in a motor for any given weight?
How many turns can be stored in a motor?
How long will a plane fly?—and why?
What makes a gas engine run?
How can a model be made stable yet efficient?
How can an efficient "Low-wing" be designed?
How can a biplane be made to fly as well as a monoplane?
What makes a plane circle to the right or left?
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JM Lacquered Gum Wood Propeller.....	25c
JM Deluxe Birch Propeller.....	35c

Junior Motors Corporation
Philadelphia

of the season where the winners of various State meets—and of course all other modelers fortunate enough to be able to attend—can shoot the works. Also we like the idea of the ratio system with 15 second motor run for timing gas models."

FRANK ZAIC, New York, N. Y.:

"It just occurred to me that it might be a good idea to check on model clubs which are near army training areas so that the army model boys will have a place to call. Or that such clubs might change their meeting dates to coincide with army boys' free time. Or even publicize where some of the boys are so that if there are enough at a certain camp they might get together. Is it apropos to suggest a Red Cross fund for overseas? In some way, now is the time to show if the international contests did promote any good fellowship."

HOWARD W. CARLSON, Milwaukee, Wisconsin:

"The motion picture, 'Youth Takes To Wings,' was shown in Milwaukee at Steuben High School Auditorium under sponsorship of the Milwaukee Exchange Club in cooperation with the Municipal Department of Recreation. This was its first appearance here and all who attended were very well pleased.

"A capacity crowd of 1500 filled the auditorium and it was necessary to refuse admittance to upwards of 700 more because of insufficient seating capacity. It was truly a gala program with music by a high school orchestra and glee club in addition to the picture itself. As a closing feature was a presentation ceremony by the Milwaukee Gas Model Club of three awards to members for design and construction of models on display at the auditorium that night.

"Inquiries were received on bookings of the picture for other public schools, so we look forward to other showings of the picture locally in the near future."

The Hard-working Contest Directors

Among the new records which are listed are several which should be emphasized particularly. However, we suggest you look them over yourself and see what modelers are doing as far as top place times are concerned. What we would like to call to your attention are the unsung heroes of the 49 new records which have just been homologated by A.M.A. contest board representatives. The heroes—the contest directors.

These gentlemen organized the meets and record trials in which the new marks were set and include Robert H. "Mississippi Valley-valley good meet, Bob" Sommers of St. Louis; Harry G. Vogler, Jr., of Pittsburgh, A.M.A. State Director; Paul A. Pumphlin of Davenport, Iowa, a newcomer—welcome, friend; J. Paul Lusk of Schenectady, N.Y.; Johnny Rappold of Chicago, the National Meet contest director; Horace Southall of Steubenville, Ohio; Fred Weimann of Milford, Conn.; Joseph Morrison of St. Cloud, Minn.; Dick "Champ" Everett of N.A.C.A.; Guy E. Dake of Oakland, Calif. "This rain won't last, boys"; Theodore L. Ravellette of Sacramento, Calif.; Dr. Paul B. MacCready of New Haven, Conn.; Steve "One-record-after-another" Obodzinski of Chicago; John W. "Red" Hilligas of Cleveland; and Richard McNally of the Jersey City, N. J., "Airwheels" club.

Without the hard work of these men and the hundreds of other official A.M.A. contest directors, no records would be possible. Our hats are off to them and we are certain they have the full appreciation of the modelers for whom they timed record flights and on whose behalf they submitted carefully detailed record applications to the Contest Board.

Certification Plan Gets Approval

The Academy's plan to "certify" chapters whose every member holds, and continues to hold, a gas or rubber model flyer's license in good standing, has been met with great enthusiasm since every member of a certified chapter will receive each month without cost through the chapter secretary a gratis copy of the A.M.A.'s bulletin, *Model Aviation*.

First over the line with an application for certification in good order was the Mainliners Aero Club of Yeadon, Pa. Twenty-four "Mainliners" under the direction of Bill Coverdale, Jr., will receive this copy of the Academy bulletin. Next in line was the Holyoke (Mass.) Gas Model Club whose 29 members will receive their bulletins through Bob Ezold, senior adviser.

Other applications are pending and will be cleared through as soon as they are o.k'd by the A.M.A.'s chapter department.

Story-of-the-Month-Club: (If you have one, shoot it in so we can publish it and become a member).

Dick Everett: I want to enter this model in the "wreck" event for the best crack-up prize.

Edward Sharp (Construction administrator for NACA): You can't do that, Dick, or we'll have to disqualify you. That model was a wreck before you flew it!

Club's Licenses to Expire at Same Time

The Allentown (Pa.) Model Cadets who are directed by Palmer M. Moyer, were desirous of having all their A.M.A. rubber and gas model licenses expire at the same time—the beginning of the May 1st competition season. The Cadets and A.M.A. headquarters folks got together and agreed to extend licenses for rubber flyers at the rate of 5c for each month up to the following May, and 10c for each month for gasoleers. Idea seems sound and other clubs might want to consider this. Those gas enthusiasts holding insurance coverage (\$1 a year, you know, for \$500 public liability and \$500 public property coverage) are exceptions, since their gas license must cover same period as insurance certificate and insurance expiration dates cannot be moved.

Lost Model Returns After Swim

While cruising about 3 miles off Ambrose Light last month Theodore Larson of Mineola, Long Island, saw an airplane in the water and went to rescue of pilots. You guessed it—the craft was a model owned and operated by Andy Mameck of New York City. All identifying marks except A.M.A. registration label had disappeared, but by means of decal number on wings A.M.A. headquarters found out to whom the model belonged. The motor was removed by Mr. Larson and given an oil bath and reported to be doing well and

IF YOU LIKE TO BUILD FLYING MODELS,
THEN YOU WILL ENJOY READING

TOM'S BOOK OF FLYING MODELS

**It gives a short cut method of building side frames—
It shows how the frames are pinned in place—
It tells about butt cementing and corner cementing—
It shows 2 methods of building round fuselages—
It gives 9 methods of building wing frames—
It tells about the different covering materials—
It shows how to cover round fuselages with ease—
It gives many suggestions for assembling the model—
and it contains over 100 illustrations.**

IT'S WORTH A DOLLAR—IT COSTS A DIME

(Fifteen cents if ordered by mail.)

PAUL K. GUILLOW, Wakefield, Mass.

soon expected to be in running condition.

Marquardt Heard From

Roy Marquardt, the traveling aerodynamic-expert, reports after a considerable absence that he's now located with Douglas aircraft in testing labs and engaged in hush-hush work with grand opportunity "to read all the new literature, etc." In addition to finding a method of calculating the perfect airfoil drag (for low-speed model work) Roy has been very busy these past months teaching aerodynamics at the University of Southern California's evening school. He is also reported toying with the idea of teaching graduate math. Advance reports indicate a predominance of model builders were expected to turn out for his aviation classes—and if enough showed up a special model group was being considered.

New Membership Cards for Leader Members

When the Academy of Model Aeronautics took over the Model Division of NAA the practice of issuing membership cards for the Scientific, Administrative and Industry leader members was discontinued and instead the very distinctive membership certificate was used. This was found quite suitable for framing.

However, it has become evident that some sort of card which can be placed in a wallet is necessary. The new type of card that has been developed might be described as a 3-in-1 affair. It shows the bearer is an Academy leader member and designates the grade of leadership; it shows the bearer

is a qualified contest director; and also allots a gas model license number so he or she can compete in meets other than those they direct or assist in directing.

This card will be given gratis with each new membership and those present members who desire one may secure their personal card by sending along 10c in stamps to Headquarters.

The membership certificate will still be available to new Academy members but instead of being given gratis will be presented upon payment of a nominal fee of 25c to cover handling and postage charges.

Is the Academy Slow in Issuing Licenses?

We hear quite a bit about how slow or how fast Academy Headquarters is supposed to be in getting out model licenses and also how efficiently this work is handled. Since it is easy to blame Headquarters whenever licenses are slow in coming through we deem it wise to advise you of how we handle this work.

Each day rubber and gas model license applications and the accompanying fees are received in the Willard Hotel, A.M.A. Headquarters. Four separate mail deliveries come in each day in addition to special delivery letters arriving at all hours. At the end of the day all applications and fees are totaled by the NAA auditor and the next morning the Academy licensing folks make a complete record of all monies received down to the last penny for additional supplies, etc. The A.M.A. daily "Income Report" has to balance with the NAA auditor's report and thus it is that

Designed By
ORVILLE WRIGHT



Has Both
Camber
and
Dihedral

5 Sec.
Assembly

NEW WRIGHT DAYTON PURSUIT

FOLDING WING CATAPULT Plane

**SOARS—BANKS
TURNS—GLIDES**

20¢ By Mail Add 5c

Thrill-ful, action-ful, suspense-ful, color-ful, streamlined catapult plane! Hurtles 100 to 200 feet at blinding speed wings open and cruises, soars, banks and turns, then comes in on flat, level glide!

Patented 'CRASHPRUF' Wings!

**DEALERS - JOBBERS
CLUBS - SCHOOLS
Premium Users**

This attractive, large-size unit (wingspread 14 1/2", length over 8") will prove the fastest-moving, generous profit item in many a moon! Write—now!—for discount schedule, posters, circulars, etc. Distributed exclusively by

INTERNATIONAL
(Models Co.)
254 W. 55th St., N. Y. C.



Scientific's New Rubber-Powered FLEET of CHAMPIONS

BIG 25" WINGSPAN

POSTPAID OR AT YOUR DEALER . . .

25¢



**LITTLE
REBEL**

LITTLE REBEL

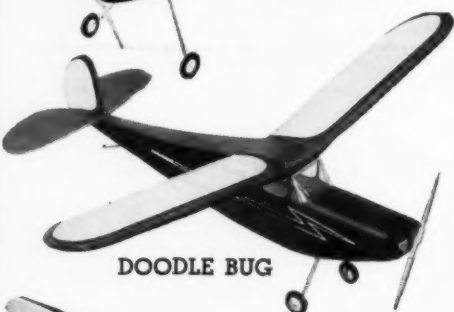
Looking for "something different" . . . a model that is easily made and yet performs with the best? Here's one that tops all of that with a color design that speaks for itself. Orange trimmed with blue, and separated by white striping—black and white stripe on fuselage. Wing is fastened by the rubber-to-dowel method.



AIR RAIDER

AIR RAIDER

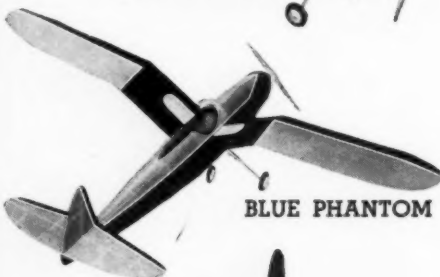
You'll burst with pride when you see this classy pursuit-type model zoom skyward for a long, smooth flight and then come down to earth with a perfect 3-point landing. Colored brown and yellow, with black and white stripe on fuselage. Polyhedral wing can be made demountable or fastened permanently in place.



DOODLE BUG

DOODLE BUG

Typical of the popular light planes of today, this sweet little job could meet all comers for looks and performance. It is beautifully finished in red and yellow, set off by black and white. Demountable wing is fastened by rubber bands which hook to dowels set in fuselage. Here's a model that will give you much enjoyment in building and flying.



BLUE PHANTOM

BLUE PHANTOM

Living up to its name, this model is an eye-catcher, not only on the ground, but also in the air. The wing has windows on both sides of the cockpit for better visibility. Gull wing, open cockpit, single-seater type. Its color design of two-toned blue, divided by white, puts the "Phantom" in Class "A."



SKIPPER

SKIPPER

Its snappy low-wing neatly faired into the fuselage sides, and the tri-cycle landing gear, marks this model as really "up-to-the-minute." Cockpit has side-by-side seating which is now universal practice. Blue and yellow color design is set off by black striping.



WIZARD

WIZARD

After you build and fly this model you'll understand why it was so named. Hope off the ground so quickly you'll be amazed at the consistently long flights it turns in. Detachable wing uses the rubber-to-dowel combination which prevents broken spars and allows easy flight adjustment. Red and white with black stripe on fuselage.

MORE THRILL

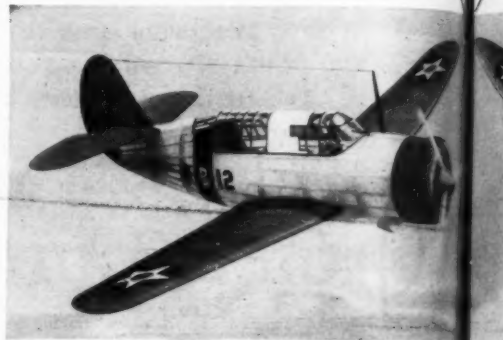
with these Gas and Rubber-Powered Models

★★★ SCIENTIFIC

DEFENSE

Flying Scale Models of America's

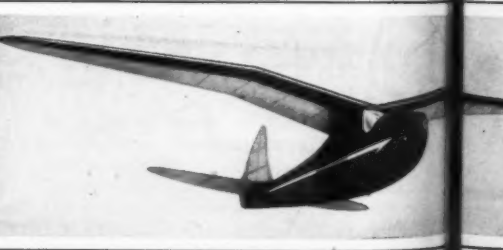
Complete Kits . . .



CURTIS SB2C-1 . . . U. S. Navy Dive Bomber



CURTIS HAWK P-42 . . . U. S. Army Pursuit



SCIENTIFIC MODEL

"GAS MODEL"

218-220 MA-12 MARKET STREET

ILL for YOU in '42

Rubbered Champions by Scientific

SCIENTIFIC'S ★ ★ ★ NS SERIES

Latest Pursuits & Bombers

Big 30" Wingspan



REPUBLIC P-47 . . . U. S. Army Pursuit



BREWSTER 340 . . . U. S. Navy Dive Bomber

An Instant Hit With Glider Fans!

ZENITH

**Double-Purpose Soaring Glider
It's a Glider . . . and a Flyer!**

Easy to build, kit is complete with all necessary materials for building both the glider and the flyer. **50¢**

DE PLANE COMPANY

MODELS QUARTERS"

T ST WARK, NEW JERSEY, U.S.A.

Here they are! Scientific's 6 Big PROVEN CHAMPIONS

in the Gas-Powered Field!

**MAKING AND BREAKING RECORDS
FROM COAST TO COAST!**

STARLING

Class "A"

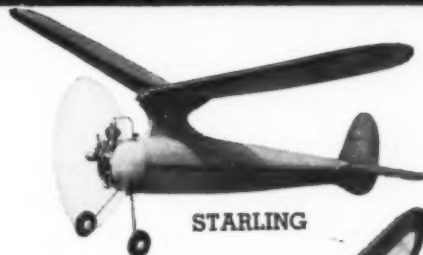
\$1.95

Postpaid or at your dealer

*Wingspan 40"

*Overall Length 27¼"

*Wing Area 210 sq. in.



STARLING

CORONET

Class "A" or "B"

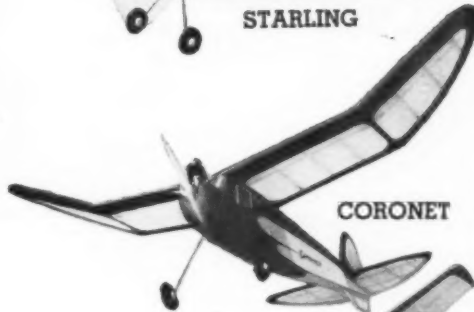
\$2.50

Postpaid or at your dealer

*Wingspan 46¼"

*Overall Length 30"

*Wing Area 300 sq. in.



CORONET

VARSITY

Class "B"

\$3.50

Postpaid or at your dealer

*Wingspan 50"

*Overall Length 33½"

*Wing Area 370 sq. in.



VARSITY

ENSIGN

Class "B"

\$3.50

Postpaid or at your dealer

*Wingspan 50"

*Overall Length 34½"

*Wing Area 372 sq. in.



ENSIGN

FLAGSHIP

Class "C"

\$5.50

Postpaid or at your dealer

*Wingspan 78"

*Overall Length 44½"

*Wing Area 850 sq. in.



FLAGSHIP

MERCURY

Class "C"

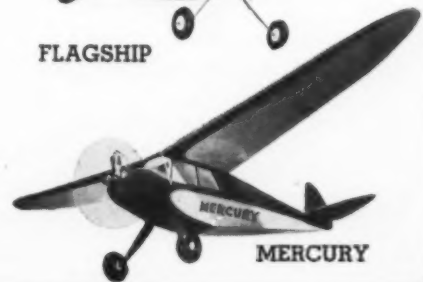
\$5.50

Postpaid or at your dealer

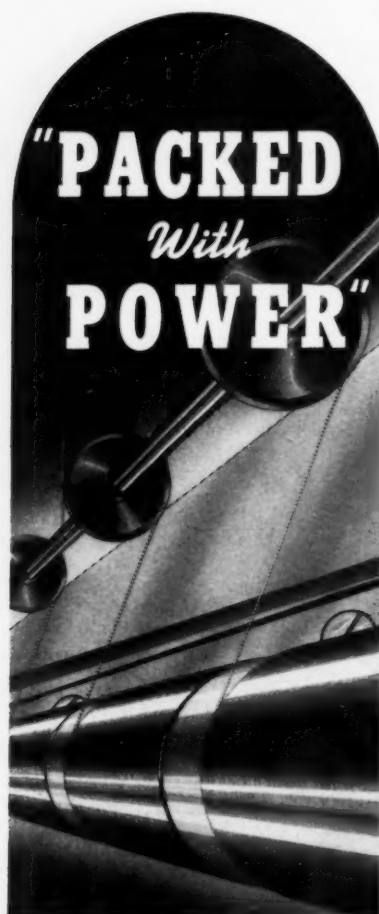
*Wingspan 6 ft.

*Overall Length 52"

*Wing Area 720 sq. in.



MERCURY



Twenty-four coils at one time wound on Smith Special Coil Winder!

COILS BY SMITH

Genuine Smith "Firecracker" Coils contain *twice* the amount of actual wire used in ordinary coils . . . thus they are literally packed with the spark volume and intensity to bring motors to top efficiency.

Above diagram illustrates 20,000 full turns of secondary wire (instead of the usual 10,000) being wound on a Smith exclusive Coil Winder . . . designed and built by Smith Engineers.

Smith Firecracker 2½ oz. . . . \$2.75

Smith Competitor 1½ oz. . . . 1.95

Smith Big Shot 5 oz. . . . 3.00

Write for full descriptive literature!



not a penny goes unnoticed.

This system was developed after conferences with post office inspectors so that your Headquarters would be in a position to account for all license fees received each day. As soon as the report is finished in the morning credentials are sent out in the afternoon by third class mail unless additional postage for first class mail is included with the application.

Thus it is that a model builder in Chicago can mail his application on Saturday and have it received by Academy Headquarters Monday morning. The license will be issued Tuesday, and should reach him Wednesday afternoon or Thursday.

It has been evident during the busy competition season now nearly ended that many meet secretaries have been lax in sending to Headquarters applications and fees for new and renewed licenses collected at sanctioned meets. This type of negligence reflects unfavorably throughout the entire activity and raises doubt in the mind of the modeler as to who is wrong—the contest director, his meet officials, or the Academy.

Under no circumstances should such license fees and applications be delayed. The most efficiently conducted meet will lose its reputation if laxity is present in trans-

mitting fees on behalf of model builders to the A.M.A.

Misaddressed Mail

A number of enthusiastic model builders, especially the younger flyers, are apt to address their envelopes containing license applications and fees to "A.M.A., Washington, D.C."

Such mail, of course, may be routed to the American Medical Assn. or the American Municipal Assn. or any number of alphabetical Government agencies. Eventually the Academy may get ahold of it. Other model builders will send in a letter with \$1.00 enclosed asking for a license and fail to sign the letter or to put their return address on the envelope.

There is nothing A.M.A. can do in such cases except to hope that the model builder will write eventually in search of his missing credentials.

Following is the latest listing of national model airplane records brought up to date through August 1941 by the Contest Board of the Academy of Model Aeronautics:

"H.L." means "hand-launched"; "R.O.G." means "rise-off-ground"; "R.O.W." means "Rise-off-water;" and "T.L." means "tow-line."

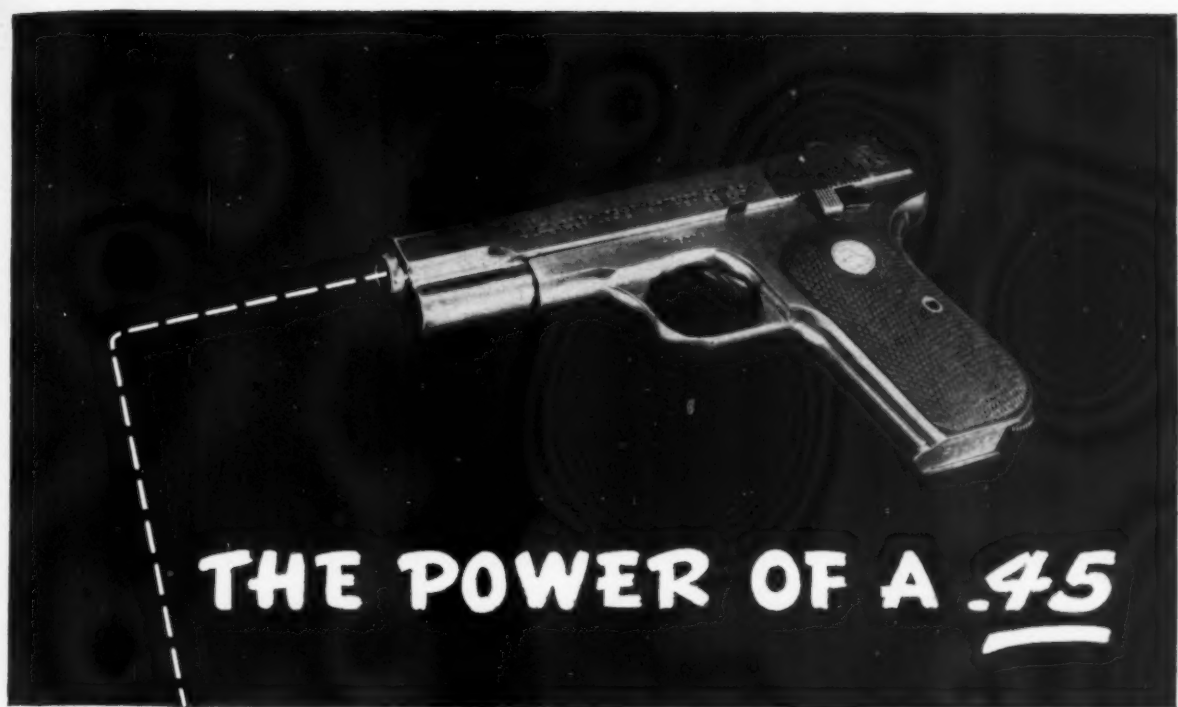
National Records

INDOORS (Longest Flight)

Stick Model, H. L., Class B		
Junior: Martin Friedland	Philadelphia, Pa.	18:55.5
Senior: Alvin Rohrbaugh	New Haven, Ind.	21:38.0
Open: Merrick S. Andrews	Philadelphia, Pa.	19:10.1
Stick Model, H.L., Class C		
Junior: R. Jagiello	Chicago, Ill.	19:17.3
Senior: Milton Huguelet	Chicago, Ill.	21:49.0
Open: Merrick Andrews	Philadelphia, Pa.	26:39.0
Stick Model, H.L., Class D		
Junior: Paul MacCready, Jr.	New Haven, Conn.	6:14.0
Senior: None Established		
Open: None Established		
Stick Model, R.O.G., Class A		
Junior: Arthur Saltzman	Philadelphia, Pa.	10:09.0
Senior: Milton Huguelet	Chicago, Ill.	12:23.5
Open: Hyman Oslick	Philadelphia, Pa.	15:32.0
Stick Model, R.O.G., Class B		
Junior: Martin Friedland	Philadelphia, Pa.	17:00.0
Senior: Martin Friedland	Philadelphia, Pa.	19:56.5
Open: Frank Haynes	New York City	12:37.3
Stick Model, R.O.W., Class A		
Junior: Paul B. MacCready, Jr.	New Haven, Conn.	1:04.0
Senior: Ted Gonzoph	Philadelphia, Pa.	10:51.0
Open: Merrick S. Andrews	Philadelphia, Pa.	8:04.4
Stick Model, R.O.W., Class B		
Junior: Arthur Saltzman	Philadelphia, Pa.	14:10.2
Senior: David Call	Philadelphia, Pa.	15:49.0
Open: None Established		
Glider, H.L., Class A		
Junior: Otto Curth	Chicago, Ill.	:44.7
Senior: Dushan Deshich	Chicago, Ill.	:46.2
Open: Leo Vartanian	Chicago, Ill.	:54.3
Glider, H.L., Class B		
Junior: Otto Curth	Chicago, Ill.	:44.7
Senior: Armando Sinibaldi	Chicago, Ill.	:46.9
Open: Joseph P. Matulis	Chicago, Ill.	:39.7
Fuselage, R.O.G., Class B		
Junior: H. Kaczynski	Detroit, Mich.	12:42.3
Senior: David Call	Philadelphia, Pa.	15:09.3
Open: Walter Erbach	Sheboygan, Wis.	15:35.0
Fuselage, R.O.G., Class C		
Junior: R. Jagiello	Chicago, Ill.	11:32.3
Senior: Gordon Cain	Boston, Mass.	15:53.0
Open: James Cahill	Connersville, Ind.	17:21.9
Fuselage, R.O.W., Class B		
Junior: None Established		
Senior: William Hawkes	Philadelphia, Pa.	3:26.0
Open: None Established		
Autogiro		
Junior: Paul B. MacCready, Jr.	New Haven, Conn.	1:51.5
Senior: Ralph Brown	Boston, Mass.	2:51.2
Open: Joseph P. Matulis	Chicago, Ill.	1:03.0
*Deceased		

(Continued on page 40)

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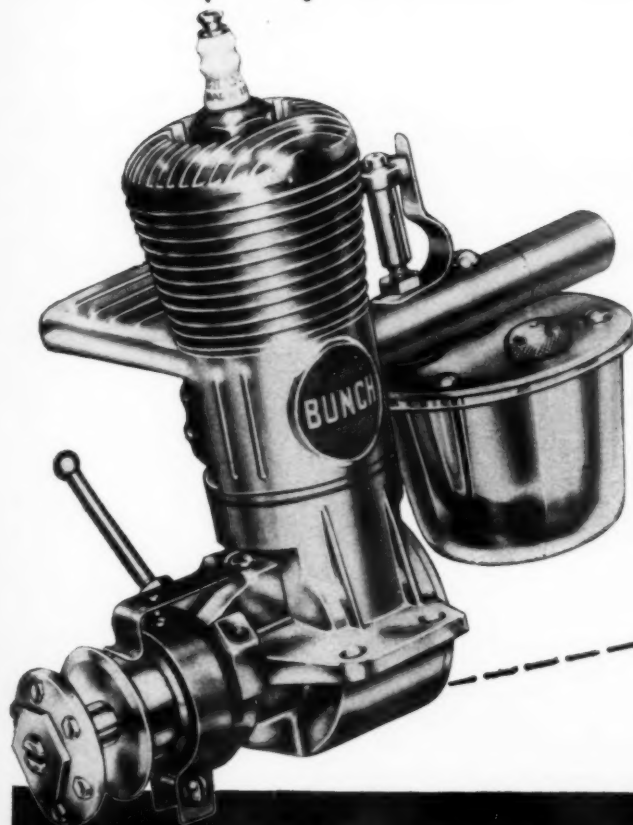


THE POWER OF A .45

THE FOREMOST hand weapon today, the gun that "packs" the most power, is an Automatic .45. It is carried and respected by military and police officials not only because it is the most effective "shootin' iron," but also because it is compact — handy to use — dependable for instant action!

The TIGER AERO engine is also a .45. In the middle of Class C it's 45 hundredths cubic inch displacement is distinctive compared to larger "blunderbus" Class C engines. Compact proportions plus a greater power output make the TIGER the most effective contest engine today!

Respected and admired for delivering the utmost in motor performance, the TIGER .45 like the Automatic .45 responds to expert handling — proper care and continued use — qualities that make all fine machinery worth while.



★
**SCRIPPS-HOWARD 1941
 NATIONALS**
 First place, Class C, Open, won
 by Joseph Cassley with TIGER
 motor at Cleveland, Ohio. 500
 entrants in competition.
 PITTSBURGH PRESS ELIMI-
 NATION also won by Joseph
 Cassley, TIGER powered ship;
 time, 13 min. and out of sight.

★
**NEWARK AIR SHOW,
 SEPTEMBER 14**
 First place in speed event for
 Controlled Flying won by Pat
 Petrosino with TIGER powered
 Fireball model.

★
**DALLAS SOUTHWEST GAS
 MODEL CHAMPIONSHIP**
 Results show Johnny Clemens,
 speed champion of Southwest,
 with his TIGER powered Fire-
 ball, first place.

ST..

★
**PLACES
 WON BY
 TIGER
 MOTORS
 THIS
 MONTH**
 ★

PRICE
\$18.50

TIGER AERO

SUBJECT TO CHANGE
 WITHOUT NOTICE

★ M O T O R ★

BUNCH MOTOR COMPANY
 5714 McKinley Avenue, Los Angeles, Calif.

★ ★ ★ ★ ★ ★ ★ ★
 CONTINUOUS DAILY PRODUCTION ASSURES
 RAPID DELIVERY OF ALL BUNCH MOTORS

RADIO CONTROL HEADQUARTERS

presents

THE 1942 EDITION OF THE
RCH INSTRUCTION MANUAL

REVISED — EXPANDED
32 PAGES

New Features:

1. "The theory of the RK-62 receiver."
2. "Control Devices."
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7. The RCH rubber powered selector.
8. The RCH rubber powered indicator.
9. "Radio Control Circuits" — the answer to the questions in the ten thousand letters received by us during the last twelve months. Eighteen different radio control hook-ups, with hook-up diagrams.
10. Other new additions to our complete line of RCH radio control equipment.

A booklet written for the radio control beginner as well as the expert.

"... it was conclusively demonstrated at the Chicago Nationals that radio control can be installed in the small model plane as well as in the ten foot jobs..."

"... RCH equipment comes completely assembled and ready to install. You can change your model boat, plane, etc., into a radio control model in a few hours..."

Ask your dealer or send twenty-five cents for Illustrated Instruction Manual. Stamps will not be accepted.

Radio Control Headquarters
330 West 42nd St., New York City

Ornithopter		
Junior: Richard Quermann	Clarksburg, W. Va.	:17.3
Senior: Robert Gibbs	St. Louis, Mo.	:3:07.9
Open: Carl Goldberg	Chicago, Ill.	:4:05.4
Helicopter		
Junior: Richard Quermann	Clarksburg, W. Va.	:3:54.6
Senior: Harry Lerman	Boston, Mass.	:5:13.8
Open: Joseph P. Matulis, Jr.	Chicago, Ill.	:2:12.4
OUTDOORS (Three-Flight Average)		
Stick Model, H.L., Class C		
Junior: Ed Vargo	Chicago, Ill.	:5:18.0
Senior: Roy Messinger	Linden, N. J.	:1:15.0
Open: Chester D. Lanzo	Cleveland, Ohio	:14:49.2
Stick Model, H.L., Class D		
Junior: Paul Oskowski	Aliquippa, Pa.	:7:23.0
Senior: Robert Davis	Clarksburg, W. Va.	:8:04.3
Open: Toful Petraitus	Akron, Ohio	:7:02.0
Stick Model, R.O.W., Class C		
Junior: Bill Seegmiller	Lakeland, Fla.	:1:04.0
Senior: Gordon Peterson	Oakland, Calif.	:48.0
Open: John Schneider	Scotia, N. Y.	:22.3
Stick Model, R.O.W., Class D		
Junior: Bill Seegmiller	Lakeland, Fla.	:1:22.2
Senior: None Established		
Open: John Schneider	Scotia, N. Y.	:42.4
Gliders, H.L., Class B		
Junior: Austin Rinaldi	Jersey City, N. J.	:2:05.0
Senior: Charles Richbourg	St. Augustine, Fla.	:2:49.5
Open: Howard Beitchman	Hampton, Va.	:5:41.0
Gliders, H.L., Class C		
Junior: Bob Codde	Oakland, Calif.	:26.3
Senior: Stewart Bennett	Oakland, Calif.	:1:07.0
Open: John Schneider	Scotia, N. Y.	:1:12.1
Gliders, H.L., Class D		
Junior: Bob Codde	Oakland, Calif.	:21.3
Senior: Clifford Doyle	Jacksonville, Fla.	:34.6
Open: Henry Thomas	Akron, Ohio	:46.4
Gliders, T.L., Class C		
Junior: Robert Hine	Gloversville, N. Y.	:53.8
Senior: Ray Frodey	Pittsburgh, Pa.	:1:34.4
Open: Mike Morel	Cleveland, Ohio	:1:24.0
Gliders, T.L., Class D		
Junior: Austin Rinaldi	Jersey City, N. J.	:2:51.0
Senior: Owen Niehaus	Rochester, Pa.	:5:42.0
Open: Richard Korda	Cleveland, Ohio	:3:30.4
Gliders, T. L., Class E		
Junior: Austin Rinaldi	Jersey City, N. J.	:51.5
Senior: Harold Geres	Flushing, L. I., N. Y.	:5:52.0
Open: George Brown	Jersey City, N. J.	:1:47.7
Autogiro		
Junior: Paul B. MacCready, Jr.	New Haven, Conn.	:12.8
Senior: Bob Meuser	Oakland, Calif.	:11.3
Open: None Established		
Helicopter		
Junior: Bill Yahne	Cleveland, Ohio	:20.0
Senior: James Ryan	Cleveland, Ohio	:42.0
Open: Elmer Shapiro	Cleveland, Ohio	:25.0
Ornithopter		
Junior: None Established		
Senior: None Established		
Open: None Established		
Fuselage, R.O.G., Class C		
Junior: Harry Robbins	Topeka, Kans.	:4:22.9
Senior: Walter Seegmiller	Lakeland, Fla.	:6:35.4
Open: Joseph Vermoch	Chicago, Ill.	:4:24.2
Fuselage, R.O.G., Class D		
Junior: Samuel Scuro	Pittsburgh, Pa.	:5:36.2
Senior: Justus Merkel	Monaco, Pa.	:7:36.3
Open: Robert Korn	Wheeling, W. Va.	:13:41.9
Fuselage, R.O.G., Class E		
Junior: None Established		
Senior: James Ryan	Cleveland, Ohio	:2:16.0
Open: Chester D. Lanzo	Cleveland, Ohio	:3:07.2
Fuselage, R.O.W., Class C		
Junior: None Established		
Senior: Manuel Andrade	Oakland, Calif.	:1:22.2
Open: John Schneider	Scotia, N. Y.	:48.6
Fuselage, R.O.W., Class D		
Junior: Robert J. Bates	Clarksburg, W. Va.	:2:33.0
Senior: Robert Davis	Clarksburg, W. Va.	:3:11.0
Open: James E. Long	Clarksburg, W. Va.	:2:30.0
Gas, R.O.G., Class A		
Junior: William Repenning	Oak Park, Ill.	:4:33.0
Senior: Joseph Beshar	Paterson, N. J.	:16:39.0
Open: W. A. Gibson	Hamilton, Ohio	:15:50.7
Gas, R.O.G., Class B		
Junior: Bobby Davis	Atlanta, Ga.	:21:53.8
Senior: B. Redeker	Cincinnati, Ohio	:9:20.3
Open: Don Lampson	Lakeport, Calif.	:14:13.6
Gas, R.O.G., Class C		
Junior: Richard Pittenger	San Francisco, Calif.	:10:10.6
Senior: Robert Sweger	St. Paul, Minn.	:15:44.0

(Continued on page 42)

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Gas, R.O.W., Class C
Junior: None Established
Senior: Gordon Peterson Oakland, Calif. 1:54.8
Open: Donald K. Foote Oakland, Calif. 2:48.4

Building a Flying Navy Scout

(Continued from page 25)

ance is not startling; nevertheless it is considerably improved over that of the old Vought "Corsairs" and Curtiss "Seagulls" (SOC-1) formerly assigned to this task. Top speed is in the neighborhood of 200 m.p.h. while cruising speed is 146 m.p.h. Specially designed slots and flaps keep the landing speed at less than 60 m.p.h. The fuel load of 199 gallons should give a cruising range of more than 1,000 miles.

The Curtiss SO3C-1 is not heavily armed. An electrically controlled machine gun is located in each wing half just outboard of the propeller arc. The observer is provided with a single gun which is exposed when the panels to the rear of his cockpit are lowered. Racks for small bombs may be installed under the wings and when being flown as a land-plane, a small torpedo may be carried beneath the belly.

Because of its ideal proportions and relatively simple structure, the SO3C-1 is readily adaptable for a flying scale model. Our little ship is a faithful reproduction of the prototype and for that reason makes an interesting model to build and fly. If carefully built from the accompanying plans, this little naval scout will take to the air as readily as "a duck takes to water."

Construction of the model is not difficult; before work is started, the pages of plans should be properly joined. Select all balsa wood carefully so the structure will be as strong and light as possible. Cement all joints firmly checking frequently for correct alignment.

Fuselage

The keel and bulkhead method of construction is employed for the fuselage. Exact size bulkheads are shown on the plan; two of each are required (except No. 5 of which four are needed). They are cut from medium grade 1/16" sheet. Cut only those notches indicated; others will be cut later as required. Four keels are necessary: the top, bottom and the two side ones. The side keels are clearly shown and shape of others is obtained by tracing the top and bottom outlines of the side view—average depth is about 5/64" and they too are cut from medium 1/16" sheet.

To begin assembly pin the top and bottom keels to position over the side view. Next cement half the bulkheads to place in a vertical position. Add the side keel and check for correct alignment. When dry, remove from the plan and add the remaining bulkheads and side keel to their respective positions. Check and recheck

the structure to be certain that it is true.

Stringers are rather hard grade 1/16" square stock. Attach those nearest the side keels first; add a stringer to each side at the same time to avoid pulling the structure out of line. Where there are no notches in the stringers, they are easily cut using a razor blade that has been broken to a sharp sliver.

"Filling-in" the nose adds to the strength and attractiveness. The area shown lightly shaded on the plan is to be fitted with individual pieces of soft 1/16" or 3/32" balsa neatly cut to fit snugly between the stringers and bulkheads. Cement two pieces of 1/4" sheet together for the nose block; cut to outline shape and remove the square section into which the nose plug fits. Roughly cut to shape and then cement the nose block to bulkhead No. 1. Cut and sand the entire nose to a smooth, accurate shape.

As shown, 1/16" sheet gussets are cemented to the fuselage to reinforce the wing mount. Cut two rib shaped wing mounts from hard 1/16" sheet and cement them to place with their base exactly parallel to the stringer; cement very firmly. The 3/32" thick blocks in the rear which hold the bamboo pin can be added also.

Landing Gear

To prevent damage to the model the landing gear must be able to absorb all shock encountered in normal flying. First make a complete pattern of the wire strut, then bend to shape from .040 music wire. A 1/16" sheet former is made, as indicated in the landing gear detail; it should fit snugly within the wire strut top. Cement the former to bulkhead No. 4 and then slip the wire over it and attach by sewing with needle and thread. Make the fairing struts from 3/16" sheet. They are of streamline cross section and have a shallow groove in the back to hide the wire strut.

Wheel pants and wheels are made from laminated sheet. Remove the centers of the inside pieces to admit the wheels. Cement the parts together and then cut to shape; looking from the top the shape is streamline. Sand the pants thoroughly and apply several coats of dope for a nice finish. Each wheel is made from two discs of 1/8" balsa cemented cross-grain. The fairing struts, wheels and wheel pants are not attached to the wire struts until later.

Tail Surfaces

Tail surfaces constructed in the following manner are both light and strong; both rudder and stabilizer are made similarly. Working directly over the plans, make complete frames using hard 1/16" sheet for the outlines, 1/16" x 1/8" strips

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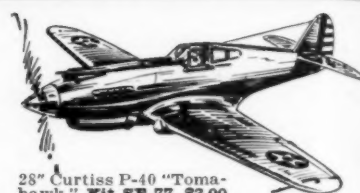
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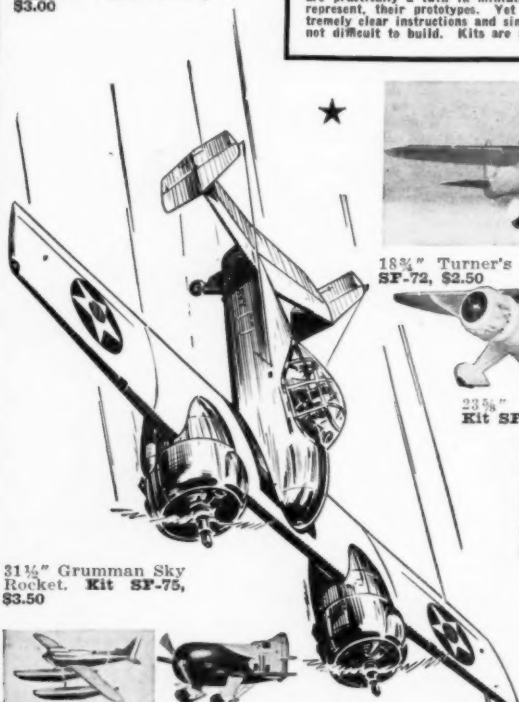
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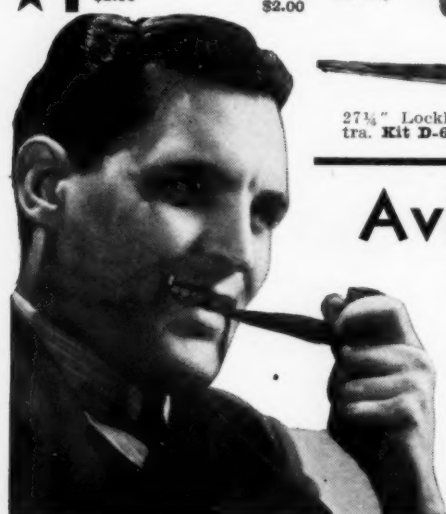
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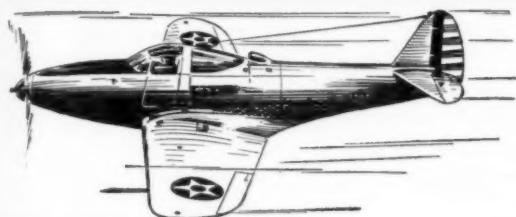
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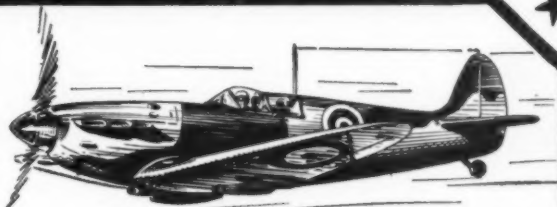
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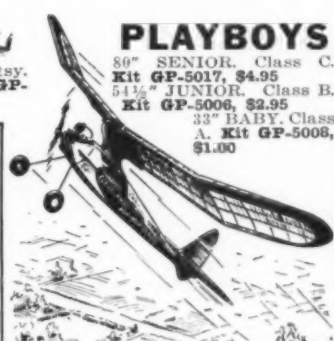
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for the spars, and 1/16" square pieces for the ribs. When dry, lift these flat frames from the plan and add soft 1/16" square pieces to each side of each rib. To complete the construction cut the ribs to a streamline shape and finish the leading and trailing edges to the indicated shape.

Wing

The wing is of multiple spar construction. Since only one half the wing plan is shown, it will be necessary to make a full scale drawing of the left wing. All ribs except No. 1 are cut from 1/32" sheet; two of each are required. Sand the ribs smooth and then accurately cut the notches. The leading edge shape is shown in broken lines over the wing plan—cut two from 1/8" hard sheet. Taper the trailing edges before pinning to place over the plan. Wing tips are cut from 3/32" stock; the pieces should be assembled directly over the plan. Pin the various parts to their respective positions; then cement all joints firmly. The spars are hard grade 1/16" square strips. When the cement has hardened, lift the wing halves from the plan and cut and sand the leading edges and tips to their finished shape.

Propeller

The propeller blank is shown in perspective on the plan. Select a hard balsa block 8" x 1-5/8" x 1"; accurately cut the blank to indicated shape. Drill the tiny hole for the shaft and then start to carve a right hand propeller. Finish the back surface of the blades first; a bit of undercamber should be sanded in each blade. Cut away the front face until the blades are of the desired thickness. Shape the blade outline similar to that in the photos. Sand with rough and then fine sandpaper until the blades are perfectly smooth and in balance. Carve the spinner in two parts from soft balsa and then cement to the hub sides.

Nose plug details are given. The front disc is cut from 1/32" birch plywood while the rear portion is laminated squares of 1/8" sheet. The plug fits neatly to the nose block. Cement washers to the front and rear of the plug to fix the line of thrust.

Bend the prop shaft from .040 music wire. Slip the nose plug, several washers and the propeller on the shaft in the order given. Bend the shaft front end to suit the free-wheel gadget being used. A loop in the end into which a winder hook can be attached is recommended.

Covering

Prepare the frames for covering by working over the entire structure with fine sandpaper. The author likes to sand the bulkheads to a scalloped shape so only the stringers will touch the covering; this aids in making a better job. Regular colored tissue is used and thin dope or banana oil is used for adhesive. Use a separate piece of tissue for each side of wing halves, rudder and stabilizer; tips, etc., require individual pieces. When covering the fuselage it will be necessary to use numerous small pieces to work around the curves without wrinkles; lap the pieces of tissue neatly. Cover the balsa nose, etc., too. Spray the covered parts lightly with water to tighten the

tissue but do not apply dope until the ship has been assembled.

Assembly

Your model is now ready to be assembled; let's complete the landing gear first. Flow cement into the groove in the fairing struts and then fit them over the landing gear wires—do not attach the struts to the fuselage structure, however. A strip of silk cloth over the strut and wire will keep it from becoming loose. Next cover the struts with tissue to match the fuselage. Cement washers to the sides of the wheels before coloring the centers and tires. Place the wheels within the pants and slip both on the axle; attach firmly with cement.

Windshields come next. Obtain very light celluloid, especially for the rear cockpit. No frame other than that shown on the plan is needed; simply form the celluloid by rolling between the fingers, then neatly attach with cement. Front windshield pattern is given. Structure of the real plane's windows is represented by tissue strips doped to place.

Since the plans were drawn, it was found that for best flight performance the stabilizer front should be lowered 1/32" to give it a slight negative angle. Cement both stabilizer and rudder to place; offset the rudder a bit for a right turn in the glide. Check the tail surfaces for correct alignment. Small tissue fillets neatly doped to place will improve the model's appearance.

Scrape all tissue away from the wing mounts before cementing the wings fast; use plenty of cement. Make the incidence of each wing exactly as shown. Wing tips are elevated so the dihedral at each tip will be 1-3/8".

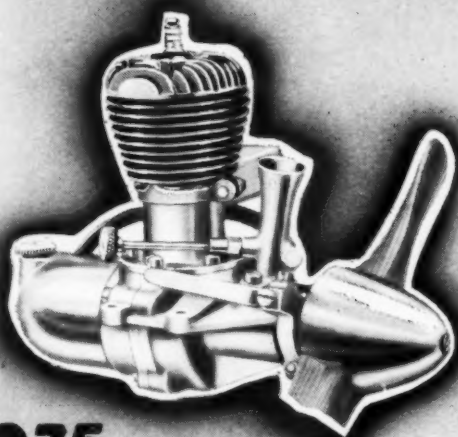
Addition of the various minor details completes the construction. One or two coats of thin dope should now be brushed on the whole model; if a bit of colored dope is added to the clear liquid, it will make a better job. Of course the propeller, wheel pants, etc., must be color doped; use several coats with light sanding between each for the best job. The stars, U.S. Navy and other details are made from colored tissue. Ailerons, flaps, elevators and such details are represented by thin strips of black tissue neatly doped to the covering. Add a tail wheel, cowl details, antenna and similar items to suit your ability and ambition and your SO3C-1 is completed.

Flying

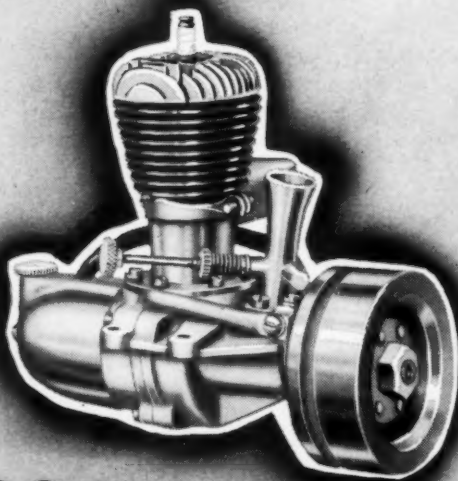
Depending on the model's weight, eight strands of 1/8" rubber or six strands of 3/16" rubber will be required for power. Lubricate the strands, hook them to the prop shaft and then drop the other end through the fuselage. As shown, a bamboo pin holds the motor in the rear. If necessary, remove a small portion of the covering to aid in getting the motor in place. Incidentally, small slits should be cut in the fuselage covering at the point of landing gear attachment so the struts can spring backward without damaging the covering.

In all probability your Curtiss will need a small corrective weight in the nose or tail to bring the model into balance; our own ship needed a tiny piece of lead in

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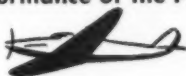


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City..... State.....

the nose. Make first flights over a grassy field to prevent damage while necessary adjustments are being made. First adjustments should favor the glide, then offset the thrust line to correct the power flight. A sliver of wood at the top of the nose plug, tilting the thrust line down, will in all probability "iron out" a stall, while right or left thrust, as needed, will control the amount of circle. Gradually increase the number of turns as flights improve. Stretch the rubber motor two to three times normal length for best flights.

Our test plane proved to be a realistic performer. However, like most models of combat planes, it is sensitive to all adjustments which therefore must be made with care. The model pictured climbs in a large left circle at a steep angle and fast rate of speed—it really seems to inherit some of the real plane's "zip." In the glide it descends in easy right circles. After many flights our Curtiss SO3C-1 remains undamaged except for a few patches in the covering. Many happy landings with your little naval scout!

Air Youth of America

(Continued from page 23)

relationship with these leaders, in order to benefit from their experience and advice," Gamache said.

Seven states are covered by the Area Directors, in which the Air Youth program is now actively under way. In announcing the names of these directors, Gamache stressed that others would be added to the list within a short time. The first ones and their regions are as follows:

AREA	NAME
Southern Texas	Edward Burgdorf Houston, Texas
Wisconsin State	Eugene Coles Milwaukee, Wis.
Upstate New York	Harry C. Copeland Syracuse, N. Y.
Michigan State	Stephen Corbett Detroit, Michigan
Kansas State	Leo Rutledge Wichita, Kansas
Missouri State	Robert H. Sommers St. Louis, Missouri
Western Penna.	M. J. Thomas Pittsburgh, Pa.

"The Air Youth program is now rapidly expanding. Questions every day come into National Headquarters from clubs, schools and leaders and from the boys and girls themselves which cannot be satisfactorily answered by correspondence. There should be somebody in the area who can act as a representative for Air Youth. We have been particularly fortunate in the men who have undertaken to serve with Air Youth; we know that our usefulness and service will be greatly increased by reason of their willingness to give us help and suggestions," Gamache said.

Kansas Program Gets Under Way

Under the leadership of Leo Rutledge, Kansas is the newest state to take up an active program in promoting model aviation as an educational factor. With the

cooperation and sponsorship of the Kansas State Aeronautical Association, and The Women's Aeronautical Association, a program to start clubs and enlist leaders has been gotten under way. Wichita, with the Steffens Air Youth Squadron, leads with several clubs already formed and actively at work.

In order to meet the dearth of trained leaders which has been created by the demand for expert model builders in the defense program, a unique model building course entirely for girls—perhaps the first of its kind—has been set up by the local NYA, working in cooperation with Rutledge. Girls who complete the course will be eligible for leadership in Air Youth clubs, or for possible future positions with the model aviation industry.

A class of thirty-two girls in the age group of 17 to 24 has been working under Rutledge's supervision, who reports the girls are showing excellent progress. Many of them may in time become eligible as workers in the defense aircraft factories. Around Kansas it is reported that there is a demand for twenty to thirty thousand of this type of skilled labor.

Philadelphia Schools Inaugurate Program

Philadelphia has now joined the growing list of schools that are adding model aviation to their courses of instruction. Victor R. Fritz, President of the Aero Club of Philadelphia, and a field director of the PMAA has been appointed by Dr. Alexander J. Stoddard, Superintendent of Schools, to take charge of the program. Dr. Stoddard, who is a member of the Air Youth National Council, in making the announcement stated:

"The plan is one that will meet a need long felt in the schools. This program may be the first step in shaping the vocational destinies of some, for aviation is becoming one of our greatest industries. But our objective is to link it up with physics, chemistry, social sciences and shopwork."

Write To Eire's Model Builders

From the Irish Junior Aviation Club of 7 Crampton Quay, Dublin, Eire, comes word to the Air Youth headquarters about model aviation in that war-shadowed country, and an appeal for letters from American model builders.

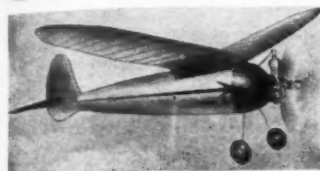
Despite the grounding of all private flying and other wartime restrictions, the club, whose headquarters are in Dublin, has maintained an active program, according to Chris F. Bruton, the club's secretary. Lectures during the winter on aeronautical subjects, which are given by well known figures, have proven particularly popular. Several model airplane contests were being planned at the time of writing.

But because of the irregularity of the mails, the club is not receiving the American model magazines and would like to have correspondence with some American clubs. All letters will be received with great interest and will be promptly answered.



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Sensational "A" Gas-kit combination **\$3.75 Value**



YOU PAY ONLY \$2.95
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Champion Garami design:
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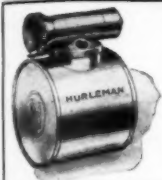
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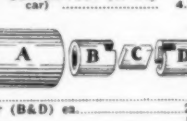
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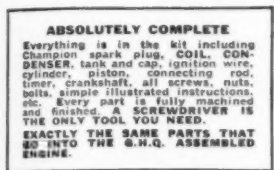
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1/16x3/16 15 for 5c	3/16 sq. 7 25c
3/32 sq. 25, 5c	1/4 sq. 6 25c
3/32 sq. 20 for 5c	1/4 sq. 3 25c
3/32 sq. 10 for 5c	1/2 sq. 2 25c
5/16 sq. 8, 5c	1/2 sq. 2 25c
5/16 sq. 6 for 5c	1/2 sq. 2 25c
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18" Balsa Sheets	18" Balsa Planks
1/8x12 5 for 10c	1x1 6c ea.
1/32x2 8 for 10c	1x2 12c ea.
1/16x2 7 for 10c	2x2 22c ea.
3/32x2 6 for 10c	2x3 35c ea.
1/2x2 5 for 10c	2x6 60c ea.
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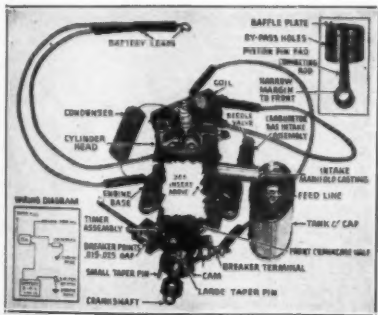
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Indeed an engineering triumph—accomplished by outstanding G.H.Q. designers and engineers, who have constructed into the G.H.Q. motor everything that years of exhaustive scientific aerodynamic research could produce—geared to the highest possible degree of perfection. But more than that, the acid test . . . an overwhelming response. Thousands of users in all parts of the country are praising, recommending, and endorsing this scientific achievement. It seems as if everyone in America wants one. The most hair-raising thrill you've ever experienced will be yours with the G.H.Q. motor—actually one of the most powerful motors ever constructed. Has broken records for amazing performance.

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H. H., Midlothian, Ill.—"Motor assembled correctly and performs perfectly. I am fully satisfied."

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Junior Motors Corporation
Philadelphia

STATEMENT OF THE OWNERSHIP, MANAGEMENT, CIRCULATION, ETC., REQUIRED BY THE ACTS OF CONGRESS OF AUGUST 24, 1912, AND MARCH 3, 1933

OF MODEL AIRPLANE NEWS, published monthly at Mount Morris, Illinois, for October 1, 1941.

State of New York ss.

County of New York ss.

Before me, a Notary Public in and for the State and county aforesaid, personally appeared Jay P. Cleveland, who, having been duly sworn according to law, deposes and says that he is the Business Manager of the MODEL AIRPLANE NEWS and that the following is, to the best of his knowledge and belief, a true statement of the ownership, management (and if a daily paper, the circulation), etc., of the aforesaid publication for the date shown in the date caption, required by the Act of August 24, 1912, as amended by the Act of March 3, 1933, embodied in section 537, Postal Laws and Regulations, printed on the reverse of this form, to wit:

1. That the names and addresses of the publisher, editor, managing editor, and business managers are: Publisher, Jay Publishing Corporation, 551 Fifth Ave., New York City; Editor, Charles H. Grant, 551 Fifth Ave., New York City; Managing Editor, Charles H. Grant, 551 Fifth Ave., New York City; Business Manager, Jay P. Cleveland, 551 Fifth Ave., New York City.

2. That the owner is: (If owned by a corporation, its name and address must be stated and also immediately thereunder the names and addresses of stockholders owning or holding one per cent or more of total amount of stock. If not owned by a corporation, the names and addresses of the individual owners must be given. If owned by a firm, company, or other unincorporated concern, its name and address, as well as those of each individual member, must be given.) Jay Publishing Corporation, 551 Fifth Ave., New York City; G. C. Johnson, 551 Fifth Ave., New York City.

3. That the known bondholders, mortgagees, and other security holders owning or holding 1 per cent or more of total amount of bonds, mortgages, or other securities are: (If there are none, so state.) None.

4. That the two paragraphs next above, giving the names of the owners, stockholders, and security holders, if any, contain not only the list of stockholders and security holders as they appear upon the books of the company but also, in cases where the stockholder or security holder appears upon the books of the company as trustee or in any other fiduciary relation, the name of the person or corporation for whom such trustee is acting, is given; also that the said two paragraphs contain statements embracing affiant's full knowledge and belief as to the circumstances and conditions under which stockholders and security holders who do not appear upon the books of the company as trustees, hold stock and securities in a capacity other than that of a bona fide owner; and this affiant has no reason to believe that any other person, association, or corporation has any interest direct or indirect in the said stock, bonds, or other securities than as so stated by him.

JAY P. CLEVELAND, Business Manager.

Sworn to and subscribed before me this 24th day of September, 1941.

RUSSELL H. UNRUH, Notary Public.

[Seal] (My commission expires March 30, 1943.)

SEE **M & M'S** New $2\frac{5}{8}$ " Flyweight Gas Wheels **PAIR PP. 75c**
 $\frac{1}{2}$ oz. PER PAIR
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the ponderous, logy expression of the British mind. However, the R.A.F. grasped the first production models of these new types and thrust them straight forth into battle and the planes were not a month old before they were over Berlin, the North Sea ports and Italian centers of industry and population. More and more we are now reading of long-range attacks by Royal Air Force bombers and we will continue to do so on an ever increasing scale in the very near future. The Bomber Command now has a ship it has long awaited and they are extracting every ounce of offensive power from it.

It would be erroneous to presuppose that the British had developed its four motor bombers from an examination of our Flying Fortress types or even gained anything of value from studies of these giant planes. There is no similarity in any detail between these new R.A.F. monsters and the Boeing and Consolidated types now used. As a matter of fact we have learned a great deal from THEM, and our latest model, the B-17D has a tail gunner's turret, developed many years ago by British designers. Therefore, we respectfully credit the British aircraft industry and the Handley-Page engineers with the development of our Plane on the Cover, the Handley-Page Halifax bomber.

The British have remained loyal to a composite type of construction which, although debated in this country, has led them to the design and perfection of planes at least the equal of those found anywhere. The Halifax is constructed of aluminum, steel, wood, linen, iron, brass, rubber, copper, magnesium and a dozen other materials as follows:

FUSELAGE: The Halifax fuselage is built in three sections. The forward section is constructed in conventional style on a framework of formers, stringers and longerons with suitable openings provided for the nose compartments and cockpits. This framework is covered with aluminum alloy sheet riveted. The center section which transmits the load to the wing spars is built up on a framework of bolted chrome-molybdenum steel tubing and the aft section is built up on a framework of welded steel tubing. The center and aft sections are covered with a light wood secondary structure over which the exterior fabric covering is sewed. The three sections are bolted together for final fuselage assembly.

WINGS: The wing is built in five sections, the center section and two inner panels being built up on a conventional aluminum alloy ribs and stringers framework. The spar is a single built-up girder with upper and lower nose flanges, consisting of Alclad skins suitably reinforced with ribs and stringers together forming a torsionally-stiff "D" section spar. The main girder is built up of laminated duraluminum flanges and tubular diagonal and vertical struts, the whole forming an "N" type truss. Aft of the spar the trailing edge section consists of duraluminum channel and tubular ribs covered with fabric. The extreme outer panels are fabric covered aft of the leading edge which accommodates the slots.

CONTROL SURFACES: The Hal-

AGAINST 1,000 *More Than* **COMPETITORS!**
The cream of the nation's modellers witnessed new, record performance when PACER 'C' topped all in '41 Nationals!

in over 2,000 **TEST FLIGHTS!**

BAY RIDGE
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PACER
Winner
Class 'C' Open
1941 Chicago Nationals

This Craft Demonstrated
"FOOLPROOF"—"BUGPROOF"
Winning Ways!



PACER 'C'
Wingspan 60"
Length 45"
Area 4 sq. ft.

PACER 'B'
Wingspan 53"
Length 37"
Area 432 sq. in.

THE ORIGINAL PACER 'B'
CONSISTENT 3 MINUTE FLIGHTS

ON 7 SECOND MOTOR RUNS!

Bay Ridge 'MIKE'
1st Small Gas Model Ship



NOW
\$1.49

ORIGINALLY
INTRODUCED
AT \$4.95

Going up to new "flight ceilings" in this popular "A" design. An ideal design for the new gas modeller, easy to construct, plenty of thermability. An excellent contest item, too! The strength of a "B" for class "A". The complete, generously-laden kit (except for wheels only) \$1.49. (At leading dealers or sent direct for \$1 deposit.)

NO SKIMPIN' in any B. R. KIT

You'll never get "caught short" with your plans down, working from a BAY RIDGE Kit! There's plenty of materials—PLUS—to finish the job, and rectifying a misstep is no problem at all!—the extras are there! Your first cost is your last cost!

Gordon Murray's
Adaptation of his
National's Winner

TOPPER 'A'

This is a faithful, revised version of GORDON MURRAY'S 1939 ("B") National Champion. The deluxe model for engines from 15 to 199 displacement. Climbs like a rocket. Skyraider wings for that flat, contest-winning glide. Complete "A" kit \$3.50. ORIGINAL 50" TOPPER: 54" span, for any "B" engine. Deluxe kit, contains everything! \$4.95



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DeLuxe KITS
Contain
Silkspan for wings. Ready-
formed parts. STREAM-
LITE Wheels.

Sal Taibi's sensational design goes on to new achievements! The consistency with which this ship performs—in both contests and sheer pleasure-flying—stamps it as the outstanding gas job of our times! Day in, day out—whether the "heat's on" or merely enjoying the luxury of leisurely flights—PACER never lets you down! PACER is no "sissy"—it's designed for strength and ruggedness! Built in adjustments. Sharp right turn under power, slow left circle in the glide. Turn is easily controlled to take advantage of every rise! Simple to construct, but skillfully stressed to withstand the hardest knocks of constant use! Ideally adapted for use with any class "B" small "C" motor. 2000 test flights demonstrated the basic superiorities!

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Complete KIT
Contains
FULL SIZE PLANS
STREAMLITE
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Silkspan for wings,
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PACER 'C' The Champion **\$4.95**
A carefully scaled, larger version of Original PACER. Time runs, in last Nationals totaled 24 min., 42 sec. **INDIVIDUAL FLIGHTS:** 1:22; 13:15 and 10:15. Complete, deluxe kit, only....

\$1 DEPOSIT BRINGS YOUR CHOICE
If no dealer near you, kit of your selection will be mailed to you direct from the manufacturer. Send only \$1.00 (cash, check or money-order) for deposit and pay the balance to the postman, when it reaches you—plus few pennies C.O.D. fees. If full payment accompanies your order, we prepay the postage. You'll be "tops" in your locality, with a Championship BAY RIDGE model.

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With the New Automatic "Prop Lock" Banner Models are the only models equipped with Berkeley's exclusive "Prop Lock" which prevents broken propellers on landings. The Prop automatically stops in a horizontal position in the glide. Every kit is complete with "Prop Lock" parts ready to install.

BANNER "SPORTSMAN"

A beautiful and easily built model with the appearance of today's most popular sport planes. Repts of 1,000 feet or more are not uncommon.

COMPLETE KIT **50¢** p.p.

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A new design in rugged construction which incorporates the streamlines of many of today's passenger ships. Kit includes a turned balsawood cowling.

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A new twin rudder design with a featured tri-cycle landing gear. Streamlined to resemble the newest modern commercial landing gear.

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30" WINGSPAN

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40" WINGSPAN

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50" WINGSPAN

COMPLETE KIT **\$1.50** p.p.

BERKELEY DIVE BOMBERS WITH AUTOMATIC BOMB RELEASE

CURTISS DIVE BOMBER

25" Wingspan

A model of the famous "Helldiver" ship that is seeing so much service overseas. A real flyer, the ship automatically drops a dummy demolition bomb in actual flight. Kit is complete with all parts necessary to build the finished model. Complete kit **\$1.50** p.p.

U. S. ARMY CURTISS P-40

27" Wingspan

The standard pursuit plane of the U.S. Army and one of the world's finest military aircraft. A model no collector of military models should be without. A model which will surprise you with its performance in the air. Complete kit **\$1.00** p.p.



VULTEE VANGUARD

27" Wingspan

Super streamlined, this $\frac{3}{4}$ " Scale VULTEE is a ship that you know will perform in the air like a real plane. The kit is complete for **\$1.00** p.p.

Other Fighter Models

- 24" Brewster Fighter **\$1.00** p.p.
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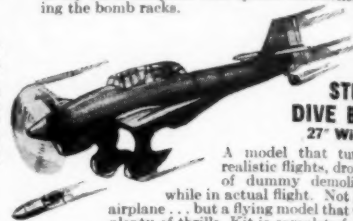


SINBAD THE SAILER

50" Wingspan

Another Henry STRUCK design. This towline launched glider equipped with Spiral Control is capable of unbelievable accomplishments. The simplicity with which you can launch makes Sinbad the Sailer a real contest winner! The ease with which you can build the ship will amaze even the most experienced builders. Complete kit.

Only from Berkeley can you obtain these sensations. Every kit is complete with special instruction for building the bomb racks.



STUKA DIVE BOMBER

27" Wingspan

A model that turns in realistic flights, dropping a dummy demolition bomb while in actual flight. Not just a model airplane... but a flying model that will give you plenty of thrills. Kit is complete for **\$1.50** p.p.

INTERNATIONAL FIGHTER SERIES

Compare them with any other $\frac{3}{4}$ " scale models selling at \$1.75 to \$2.50! Only Berkeley gives you: Semi-Planked Fuselage, Balsawood Covered Landing Edge, and Wire reinforced landing gear.



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27" Wingspan

A model that is an exact $\frac{3}{4}$ " scale duplicate of its prototype. The finished model is sleek and neat and can't be beat in performance in the air. Complete kit **\$1.00** p.p.



FLYING CLOUD

44" Wingspan

Henry STRUCK designed. You're off to new records and better performance with this glider ship. The propeller retracts into the fuselage with the rubber band motor unwinds, reducing wind resistance in the glide. Kit is complete with fittings ready-made less rubber.

unwinds, reducing wind resistance in the glide. Kit is complete with fittings ready-made less rubber.



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BUCCANEER "B" Special

Featuring
Stall-Proof
Slotted Wing
and
Spin-Arresting
Tail

56" Wingspan

\$3.95
P.P.

This newest BUCCANEER gives you the ultimate in safe, stable super-performance. The ideas incorporated in this ship are the result of the latest N.A.C.A. Wind Tunnel Tests. No more whipstall or spins due to improper adjustments with the BUCCANEER "B" Special, the only gas model with wing slots and spin-arresting tail. Power it with any Class "B" or small Class "C" engine. Kit includes finished propeller, rubber wheels, formed-landing gear. Complete kit \$3.95 p.p.

BUCCANEER "C" Special

Fl. Wing
Kit, Complete

Complete Kit
with Timer

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P.P.

Class
"C"

The cabin contest model that approaches design perfection. Rugged construction gives the "Special" the highest weight-strength ratio of any model. Spin arresting stabilizer setting. A glide ratio that exceeds wind tunnel calculations. Your best contest bet in Class "C". Kit is complete with Silkspar, dope, and Flight Timer. \$5.95 p.p.

AMERICAN ACE

Henry STRUCK Design

AMERICAN

ACE "54"

54" Wing

American
Ace "36"
36" Wing

For Atom and Elf engines. Just like the 54" Ace, this ship turns in performance with the midgets that will amaze you.

COMPLETE KIT \$1.50 P.P.

Holder of the National Class B Record on Land and Sea. Henry Struck Designed. For all engines .19 to .49 displacement. All over the whole U.S.A. the AMERICAN ACE is smashing records and winning contests. The most popular gas model in America today because it is so easy to make perform. No, tricky adjustments necessary, just snap on the wing and she takes care of herself. Complete kit with silk, finished landing gear, liquids and hardware. \$3.95 P.P.

Custom CAVALIER

The only model of its kind and the best model for radio control work. The "Custom" CAVALIER is truly the proudest product of the builder's art. Whether you are looking for streamline beauty, dynamic glide, or general all-around flyability, if you want the best... the peak of perfection your choice has to be the "Custom" CAVALIER. Kit is complete (less wheels) with 30 square feet of construction drawings.

3 Foot Wingspan

\$15.00 P.P.

BERKELEY'S line of gas kits is the fastest and most complete line of kits available at any price. BERKELEY is doing its part to "KEEP 'EM FLYING" by keeping its prices as low as possible and keeping the BERKELEY Kits within the means of all modelers. Because of national defense and the great demand for Berkeley Kits, when ordering for Christmas delivery either by mail or thru your dealer, we ask that you make a substitute choice in addition to your preference.

MUSKETEER "42"

42" WINGSPAN
Class "A" \$1.95 P.P.

MUSKETEER
"54"

54" Wingspan
CLASS "B"

\$2.95
P.P.

MUSKETEER
"STANDARD"

6 Foot Wingspan
CLASS "C"

\$3.95
P.P.

3 MUSKETEERS

The MUSKETEERS in any of their 3 classes are tops for simplicity of construction, strength of design, and grace of flyability. In the MUSKETEER "42", "54" and "Standard" you have contest performing ships that turn in consistently fine flights. Not just occasional performers, the MUSKETEERS are not temperamental and will give you peak performance on every flight.

New! Folding Gas Model Props



ALL SIZES

8", 9", 10", 11", 12", 13" & 14"

EACH \$1.00 P.P.

FOLDING PROP

Recent wind tunnel tests prove that the propeller has 300% more drag than the fuselage on many models. The only way to improve the glide on today's models is with a folding prop. Try one and see the difference. Each prop is made of select birch, lacquer finished, with stamped metal hub. Packed in cellophane with full instructions for installation.

MOTORS

Recommended for use with Berkeley Gas Models.

Class "A"

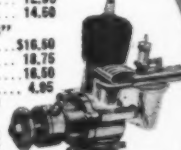
Super-Atom \$15.50
Perky "A" 12.95
Ohlson "19" 14.50

Class "B"

Ohlson "23" \$16.50
Forster "29" 18.75
Cannon 300 18.50
Rogers KD-29 4.95
Rogers 29... 12.00

Class "C"

Cannon 358 \$18.50
Rogers 35... 12.95
O.K. 49... 16.50
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Brown Model D... 16.50
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Forster Super 99... 49.00
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INC., M-12, 230 STEUBEN ST. BROOKLYN NEW YORK



"SCRAMBLE!"

The R.A.F. word for action

The contest winner's word for action is "ADVANCED"! The new Advanced HURRICANE "69" gets into action fast—right now! Fast takeoff. Rocketlike climb. Floats like a cloud. Get one today and take home the trophies. Designed for .60 cubic inch motors.

Wing Span: 69 in. Overall: 43 in. Wing Area: 738 sq. in.

NEW Advanced HURRICANE "69"



Advanced EXPLORER "50"
A Class B Advanced model, made with micrometer accurate Green End Balsa, has a fast climb and slow glide that is amazing experts everywhere.
Wing Span: 50 in.; Wing Area: 310 sq. in.; Overall: 39 in.
Complete kit: \$2.95. Add 25c for packing and postage.

Complete Kit
\$5.95
Add 25c for postage and packing.



ADVANCED CHALLENGER "51"

Complete Kit
\$2.50

Four more places for the Advanced CHALLENGER "51" in September. First in Sacramento, California; first and second, Class A, at Woodland, California; second in Grapeland, New Jersey. The CHALLENGER is unchallenged as a Class A or B contest model anywhere today. Wing Span: 51 in. Wing Area: 290 sq. in. Weight ready to fly: 16 oz.



Advanced Vanguard "66"

Complete Kit
\$4.95

The Advanced VANGUARD for consistent high performance with small Class C motors.
Wing Span: 66 in.; Wing Area: 532 sq. in.; Overall length: 41 1/2 in.

Add 25c for postage and packing.

ADVANCED ENGINEERING CO.

DEPT. MA
FRESNO, CALIF.

fax is fitted with the Handley-Page automatic slot which moves forward as the stalling angle is reached, permitting air to leak into the flow in such a manner to increase the stalling angle and thus permit the wing to return to normal attitude by the pilot's control. Handley-Page slotted ailerons are also fitted. The slotted type flap is used on each inner wing panel trailing edge and outboard to the ailerons. The tail surface is the twin rudder type, the horizontal stabilizer resting atop the rear fuselage and the vertical stabilizers being attached to the extremities. The rudders and elevators are duraluminum constructed, fabric covered; all control surfaces are fitted with control tabs. The fixed surfaces are all metal with an Alclad sheet covering stiffened with "Z" section stringers.

LANDING GEAR: The problem of the landing gear for a bomber so huge as the Halifax was a special one. It had to be designed with the following problems in mind: the satisfactory support of the tremendous weight of the loaded airplane, the satisfactory retraction of the wheels into the wings, satisfactory braking and ground handling characteristics and the satisfactory handling of the airplane on muddy or unimproved war-time landing fields. For these reasons single balloon tires, the largest ever built in England, were installed. These wheels are supported on heavy "U" shaped trusses built up on a box-spar type of structure. Two shock absorber units are installed, one on each side of the wheel. The main supporting member breaks in the middle and the wheel is retracted rearward into the aft end of the inboard nacelle through the hydraulic action of a break-strut. The tail wheel is also the balloon type and is not retractable, there being no room to permit its retraction into the fuselage and still permit the tail gunner to move forward into the fuselage when necessary.

POWER PLANT: The Handley-Page Halifax is powered by four Rolls-Royce Merlin engines type XI mounted in individual wings nacelles. This engine has a total displacement of 1647 cubic inches

(somewhat less than our Allison) weighs 1352 pounds and has a frontal area of 5.85 square feet. This engine is the latest developed by the Rolls-Royce firm and is actually a modification (and improvement) of the R.M.2S.M. series (standard Merlin equipped with two-speed supercharging). This latest design has a takeoff rating of 2,040 at sea level, although it is impractical to develop this power at sea-level. Normal takeoff rating is 1,300 horsepower and it has a maximum power available of 1,145 hp. at 16,750 feet. It is cooled by ethylene glycol fluid contained in a header tank located in the upper rear portion of the power plant compartment (forward of the wing) and is cooled in a large circular radiator located beneath the engine drive shaft. These four large scoops are swept forward to give a more pronounced "scoop" effect on the air.

Ejector-type exhaust systems are provided for the front two exhaust ports only, the remainder of the exhaust being routed into the turbo-supercharger drive. The oil coolers (two per engine) are located below the engine on the interior of the nacelle and air is obtained through retractable scoops. Each nacelle carries its own individual oil tank with a total capacity of 41 gallons each, giving a total oil capacity of 164 gals. The fuel system consists of four major tanks and two reserve supply tanks with a total capacity of 1620 gals. These major tanks are carried within the center section and each inner wing panel, the reserve tanks being carried in each inner wing panel trailing edge. Both the oil and fuel tanks are of composite construction, thus bullet-proof.

Each fuel tank is divided into twelve cells, controlled by small electric pumps run off the main electrical system. The fuel flow to the main fuel cock and cross feed within the fuselage is thus maintained by manipulation of these motors. From the main fuel cock it is routed to the individual engines through the use of regular engine-driven fuel pumps. Oil is delivered by gravity feed and the use of two-stage oil pumps. Propellers are three-bladed De Havilland constant speed

designs manufactured under license from the Hamilton Standard firm in this country. They are enclosed in huge conical spinners which also serve as de-icer equipment.

ACCOMMODATIONS: The Handley-Page Halifax has been designed to incorporate every item of equipment necessary for comfortable, safe and efficient completion of bombing missions. Twelve men make up the complete crew, although as few as four may successfully operate the ship. In the nose is the front gunner housed in a power-operated multi-gun turret in the upper portion of the nose compartment. The lower glassed-in housing accommodates the bombardier who handles the secret bombsight developed in this country and now used by the British. Immediately behind him on the lower deck is the navigation officer or radio operator as the case may be, although it is intended that this compartment serve primarily as a radio officer's quarters. Immediately above on the top deck is the control cockpit in which are located the pilot and second officer. Aft of this is the navigator's room with a special glassed-in cupola through which sights may be taken of the stars when on night flights and the sun during the daylight activities. Immediately aft of this extending through both decks is the bomb compartment with a small passageway along the top half-deck to permit necessary passage of crew members. Aft of this is the chief mechanic and electrician with a variety of dials and instruments. The first assistant crew chief is also located here, who functions as an armorer for the supply of ammunition, oxygen masks and various items of equipment as demanded.

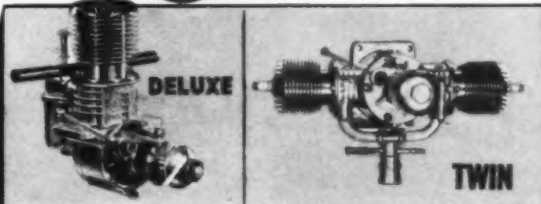
In the extreme aft fuselage end is the tail gunner also located in a power-operated multi-gun turret. Provisions are also made for the transport of a full squad of men (eight) within the rear compartment when required and an auxiliary chair and quarters may be installed aft of the pilot for the observer or commander of the ship, often a squadron leader or



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wing commander in command of the entire mission. Entrance is gained to the ship through hinging doors which lower from the fuselage bottom with ladder steps on their rear side. There are two of these, one just forward of the wing and one just aft of the bomb compartment. Entrance and exit from the rear gunner's compartment is made through a small emergency exit just forward of the turret.

ARMAMENT: Armament aboard the Halifax consists of several various systems of arming. The present armament equipment aboard the experimental types now in use consists of a pair of 50 caliber Browning machine guns in the plane's nose mounted in a special power operated turret. A similar installation is located in the ship's tail. It is understood, however, the preliminary operations have proved the desirability of more guns, and newer types of the Halifax carry the famed Boulton-Paul four-gun power turret in both nose and tail. In addition, a newly developed twin-cannon (37 millimeter) power operated turret is being installed along the broad back of the Short Sterling and it is not unlikely this same device very shortly will be fitted to the Halifax.

The bomb load is carried completely within the fuselage and provides for a variety of bomb loads in the total weight of eleven thousand pounds. The smaller bombs are carried vertically in special, quickly-detachable mounts, the large types being carried horizontally. They are all released through solenoid relays from the bombardier's switch control box. It is claimed that more than fifty thousand rounds of ammunition is carried aboard the Halifax.

SPECIAL EQUIPMENT: The Halifax carries complete oxygen equipment for an entire complement of officers or crew members, each member donning his mask and controlling a personal supply located adjacent to his station. The Halifax carries complete de-icing apparatus on the leading edges of the wing and tail surfaces. Provisions have been made for installation of flotation compartments in the wing, inflatable dinghy, message pick-up gear, camera (both fixed gun and panoramic mapping camera), landing lights, signal lights, recognition and identification lights.

DIMENSIONS AND WEIGHTS: The Handley-Page Halifax has a wing span of 99 feet 4 inches and is 70 feet 9 inches long. It stands 22 ft. 7 1/2 in. high in the three point position on the ground. The tail plane has a span of 26 feet 2 inches and the main landing gear wheels are 5 ft. 5 in. in diameter.

The Handley-Page Halifax has an empty weight of 35,600 pounds and weighs 53,450 lbs. when fully loaded. This gives it a power loading of 11.6 lbs. per horsepower and a wing loading of 24.4 lbs. per square foot of wing area.

PERFORMANCE: The Halifax has a top speed of 310 miles per hour and cruises at 278 m.p.h. It has a landing speed of 72 m.p.h. and a cruising range of 3,600 miles. This latter may be increased through installation of additional fuel tanks to approximately 5,000 miles. Initial success of the Halifax was the

use of three of them, in company with six Wellington types on a raid on Berlin, where, for the first time, the Reichstag was damaged. On this same foray the vital Kroensteg railway station, and the power station and electrical works of the Bosch Electric firm were severely hit. Just two weeks after this, a total of six Halifaxes were engaged in a mission from the vicinity of London to several vital cities in Italy and over the island of Sicily. These raids demonstrated their extremely long range and heavy hitting power and they are being placed into production on a large scale as rapidly as possible, although this is an arduous task from the start.

However, it was recently stated in the British Air Ministry that one thousand of these super bombers would be completed and in active service by the mid-summer of 1942. Should such a fleet not only be produced but put to actual use, the turning point of the War might not be later than Christmas of next year. Germany has no comparable bombers and with the increase in the Fighter Command of American-made interceptors and of ground defenses in England's vital cities, the Luftwaffe will have an insurmountable obstacle to overcome in the "paying back" of these raids.

Should such a turn come to pass and Hitler could no longer boast to his people that for every bomb dropped on Berlin a dozen were falling on London, it is likely that the flame of dissatisfaction and revolt might easily flare into rebellion, something for which we of the democracies pray. And if the task is laid square on the broad wings of the Halifax, peace will loom nearer.

Model Designing Simplified

(Continued from page 13)

upon the wing section used and wing loading. In the table, page 13, various wing sections are listed, giving a wide performance range and corresponding minimum flying speeds are given for different wing loadings. All that is required is to know the wing section to be used and the ounces per square foot of wing to be carried; then speed can be determined.

The Grant X9 section gives high lift and efficiency with excellent climb so this is selected for our model. The wing loading is 8 oz. so plane speed is shown in the 8 oz. column to be 20 miles per hour. The correct pitch of a propeller mounted on a plane with a 20 m.p.h. minimum level flight speed is given in the adjacent right-hand column, indicated as 8 in. This is for propellers turning at 4000 r.p.m.; the most efficient propeller speed possible with average model engines. Therefore the pitch speed is 32,000 in. per min. or 30.3 m.p.h.: Approximately 50% greater than plane speed.

As the propeller turns at 4000 r.p.m., and as the motor delivers a definite amount of torque (turning effort) at this speed, the propeller's resistance to turning must equal this torque at 4000 r.p.m. Consequently the diameter and blade area must be such that exactly this amount of resistance is generated.

The fourth step therefore is to deter-

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INTERCEPTORS UP



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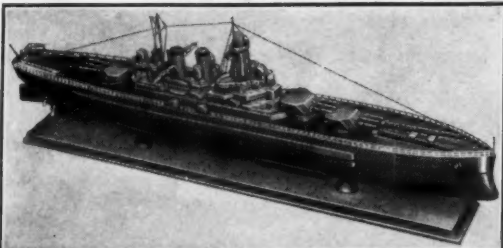
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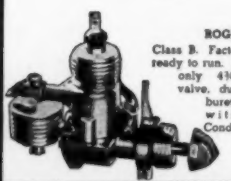


KD-28 \$4.95

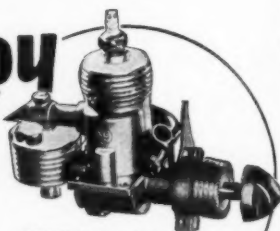
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mine these required factors. Best results are obtained when the blades have an area resulting from a blade width of one-tenth the diameter, so area therefore can be expressed in terms of diameter alone: ($D \times D/10 = \text{area}$). Power can be expressed in terms of engine piston displacement represented by symbol C_u . The known quantities are Pitch, $P = 8$ inches; Piston displacement, $C_u = 0.29$ (specified in article 11, October issue). These are the only factors required in order to determine the one other unknown factor—diameter. When the latter is determined propeller specifications necessary to construct the propeller are complete.

Diameter can be calculated by the following formula, in terms of P and C_u :

$$D = \sqrt{\frac{675000 (C_u)}{P}}$$

This will serve also to give the correct propeller diameters for other engines that possibly may be used in the model, such as one of $C_u = 0.23$ or $C_u = 1.9$ (Class A).

Next month the solution will be given for all three piston displacement values, also a simple graph making it possible to determine the best propeller diameters for engines of any displacement or required pitch. This will give you the answer at a glance and thus simplify your design problem.

Until then—Happy Landings!

Flash News

(Continued from page 31)

been known that Hitler cannot be annoyed with the trouble of providing and feeding prison camps and thus he may be using his ally for this purpose.

A Douglas C-39 Army transport contracted engine failure in both its engines while en route from McClellan Field Air Depot, Sacramento to Amarillo, Texas, crashed through a house near Winslow, Arizona, losing its wings and came to rest with its nose in the wreckage of another house, all with no fatalities!

Another real-life adventure story was revealed recently when a large Royal Air Force Coastal Command seaplane of the Consolidated PBV type lost its way over Iceland and crashed into a mountain side. Iceland has a large lava desert as arid and dangerous as our own Death Valley and the crew of five was badly injured with the exception of the pilot. After carefully laying the injured men, including his Captain, in a sheltered spot, he trekked across this treacherous "desert" to a small fishing village where he telephoned to his squadron base headquarters for aid. Since the ambulance could not cross the lava beds, he returned to the spot and personally carried his captain to safety, although weak from loss of blood.

Definite plans have been made to convert all the new "Liberty Fleet" type transports into seaplane emergency tenders. According to a high official of a firm manufacturing these types: "Should it be necessary, all this type cargo ship can be quickly converted into seaplane tenders and even small aircraft carriers."

Another composite picture: the average New England Army flying cadet is 22 1/2 years old, 5 feet, 10 inches tall and weighs 160 pounds, this height and weight being far above the general average of the Air Corps as a whole. However, he has brown hair, blue eyes and a ruddy complexion as does the average Air Force pilot.

Eugene Quimby Tobin, 23-year-old member of the American Eagle squadron, was shot down over France but, according to Quentin Reynolds, visiting with the squadron as a news representative of a large American magazine, landed safely with his ship under full control.

In the interest of economy, the Army has abandoned the snappy slate blue uniforms of blouse and slacks which for years have distinguished flying cadets from commissioned Army fliers. They will now wear the conventional olive drab of the regular service.

According to J. L. Ralston, Canadian Minister of National Defense and C. D. Howe, Minister of Munitions and Supply, Canada's No. 1 and No. 2 men in their war effort, Canadian purchases of Lockheed, North American, Douglas and Consolidated trainers, bombers and flying boats are being paid for in cold, hard cash and goods are not being purchased under the general British lend-lease agreement; further evidence of the independence of Canada from the mother country.

Coming as a possible straw to break the camel's back, administration tax leaders are now proposing a six percent profit ceiling on business. Aircraft manufacturers are actually losing money on the present 10-15% ceiling on cost-plus-fixed-fee defense contracts and should this be cut to the six percent figure, repercussions of a possibly permanent nature might result. It is interesting to note that Royal Air Force contracts in this country are being paid for in United States dollar bills and contracts are being handled through the Office of Production Management. We wonder how many years it will take the U. S. to completely unsnarl the tangles of this defense effort?

First Navy business to fall Vultee's way will be the release of a number of Vultee BT-15 trainers to the Navy by the Army. Designations have not yet been released but first deliveries are now being made.

The Army is now receiving quantity deliveries on the new and deadly Bofors anti-aircraft gun. This new type A.A. gun can fire seventy shots per minute and has a vertical range of almost two miles. It has a horizontal range of 11,000 yards and the sensitive projectile nose can be exploded by even the thin fabric of airplane tail surfaces. We have needed these guns for a long time, not necessarily for immediate installation, but for emergencies.

A tribute to Wright Field, Dayton, Ohio: Research which has been under way for more than ten years is now bearing fruit in this greatest of all war efforts among which are: the development of synthetic materials such as synthetic fabrics of certain types which have been tested and approved for use in parachute shrouds and silks, synthetic cotton webbing for harnesses, synthetic aircraft linen



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TWO NEW BATTLE PLANE FLYING KITS WITH SENSATIONAL OTT-O-FORMERS



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SPITFIRE FIGHTER . . . 45 INCH . . . \$1.50
A superb model of the famous plane of the British R.A.F.



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LOCKHEED INTERCEPTOR . . . 45 INCH . . . \$1.50
A breath taking model of this famous fast American ship.

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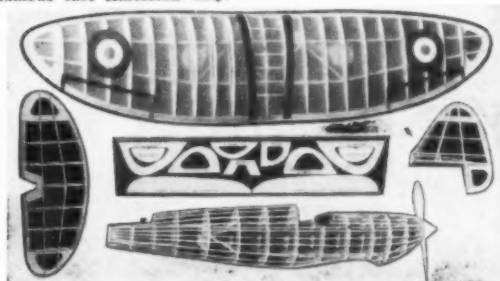
Here you see a Spitfire ready for easy and quick assembly. Making these parts is just as easy using wholly and partially die cut OTT-O-FORMERS. (Copyrighted and patent pending) Make your next plane from an OTT-O-FORMER KIT. You'll be surprised and pleased with the strong, light weight ships you can turn out.

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for control surfaces. Also developed have been racks to carry and release quantities of small fragmentation bombs whereas former bomb racks accommodated only the larger type bombs, intervelomotors which space the dropping of bombs in a barrage train, amazing results in development of high-duty metal alloys for strength-weight efficiency in aircraft construction including magnesium, beryllium, stainless steel and various aluminum and steel compositions. New paints for use as camouflaged have been developed as well as flash bombs for night photography, oxygen equipment for high altitude work, and a vast amount of research in aerodynamics in a 20-foot wind tunnel. Hats off to Wright Field!

The War Department has awarded T. W.A. airline a contract for \$599,760 to train suitable pilots for the ferrying of four motored heavy bombers. This will also be used to train not only pilots but air and ground crews as well. This work will be carried out at T.W.A.'s civilian contract flying school at Albuquerque, New Mexico. The crews will be made up of five men: pilot, co-pilot, navigator, flight engineer and radio operator selected from Col. Robert Olds Ferry Command.

Instead of Germany stealing details of our new bombsight it was recently revealed at an F.B.I. spy ring investigation that the United States has thoroughly

examined German bombsights taken from bombers brought down over England intact and has actually used certain details of it in the construction of the new and mysterious Norden bombsight!

Climax to one of the most amazing air adventures in modern times came recently when the wreckage of the tiny Aeronca monoplane, "Baby Clipper," was found in which Thomas A. Smith took off from Old Orchard, Maine (traditional leaping point of many a famed trans-Atlantic flight), in May of 1939 and was never heard from again. He had intended a lightplane flight to England with his tiny 65-horsepower engine and every possible inch of the cabin was taken up by gasoline tank. The wreckage was found by Royal Canadian Air Force fliers on military missions; the plane was found in the wilds of Newfoundland and only conjecture explains the fate of the 25-year-old flier. It is believed that he set out to find civilization and foundered in the wilderness.

Britain has agreed to release large numbers of long-range bombers to Russia and the first are now in process of modification. Soon they will begin the arduous task of flying from their Southern California birthplace to Alaska, thence through Siberia to the Western Front. Others already on the East coast and in England will be flown to Russia straight across Germany by night. The role of the ferry pilot now becomes an ever increasing important one in modern warfare. "It will depend upon the weather," said Col. Robert Olds, commander of the Ferry Command. "If the Alaska-Bering Straits-Siberia route freezes over and makes the flights impractical we will continue our routes across the Atlantic and thence to Russia."

Reversing the story of American supply of materials to the British comes the announcement that 635,000,000 pounds of aluminum are being purchased by the United States from Canada for use here on warplane production lines. This is greater than the entire amount produced by us in a single year and graphically points out the much-debated shortage.

A thrilling tale of adventure was revealed recently when a reconnaissance plane of the Colombian Air Force discovered three men on a raft floating down the Ouje River. After their rescue they turned out to be the only survivors of the crash of a huge tri-motored transport plane which crashed into a mountainside with sixteen passengers. The remaining thirteen were killed when the plane burst into flames. The survivors explained that they leaped from the plane as it hit and were thus saved. They had endured unbelievable hardships in existing to build the raft and start for civilization. Truth is still stranger than fiction.

LOUISIANA WAR GAMES: Although it is still too early to comment on the results of this, the greatest of all American war games, it is safe to say that every item and branch of national defense were engaged. Four men lost their lives in the first two days of the maneuvers when two planes engaged in sham air battles collided. They were 2nd Lt. R. H. Keith and Leland A. Vair. The other pair lost their lives in a crash of fighting planes due to a collision. They were 1st Lt.

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Name _____ Age _____

Address _____

City _____ State _____ A-1-MA

Walter A. Boyd and Corporal Artie M. Howard. Real bombs were used by dive-bombers and real bullets used by fighters during attack maneuvers over Barksdale Field. Every type of airplane was used and the new Bell P-39 "Airacobras" proved their worth many times over. It is just the kind of test our new Army needs and more in the future will be needed to give the men actual battle and combat experience. Even play-war is dangerous today!

The strange passion that makes a youth want to fly flaired to its fullest recently when young James Joseph Carlton was hauled into a California Court for speeding. He served a five-day jail sentence and a few weeks later applied for admission to the Naval aviation training school and was refused on account of his jail sentence. He returned to the court and asked the judge to write a letter to the Navy recruiting officer explaining that the penalty was excessive. The judge refused and stated he was going to write a letter giving the bald facts of the case. Seeing his dreams of flying for the Navy fading, Carlton grabbed the citation and records of the incarceration and tore them to bits spraying them along the street as he ran. Officers finally cornered him and he is now in jail on a charge of destroying public records. "I knew that those papers were the only thing standing between me and a career as a Navy flier and I simply had to destroy them," Carlton had dreamed of joining the trans-oceanic Ferry Command after graduating from the Navy school, but he is now languishing in jail with all hope for wings abandoned.

Japan recently announced: "Vegetable oils now have successfully been processed as aviation lubricating oils," which means another development in the axis "ersatz" campaign. Another new development by Japan in this same field is: "ninety percent of used oils are being reclaimed for aviation purposes." This latter process, long a scientific goal in this country, would result in great economy in use of automobile and aviation oils. The necessity for oil conservation becomes apparent

when it is realized oil taken from the ground is never replaceable and only that quantity there now will ever be found.

Captain Midnight has vowed to doom Hitler to destruction! Not a veteran officer who will bomb Hitler to destruction, but a large black cat which was recently placed aboard a Consolidated "Liberator" bomber bound for England. "He will fly with this plane until he has crossed Hitler's path!" Lieutenant Espeth explained.

Latest Nazi warplane carrying the Luftwaffe into action on both the Eastern and Western Fronts is the Messerschmitt Me-115, an entirely new single-seat fighter which is equipped with a 1600 horsepower Mercedes-Benz engine, has a top speed of 440 miles per hour and a wingspan of only 31 feet, less than the standard Me-109's now being obsoleted.

Largest scale test "black-out" yet staged is now being planned by Mayor F. H. LaGuardia, U.S. Civilian Defense director. "We are planning to stage a black-out of the entire Pacific Coast from California to Alaska in the immediate future to test the possibility of its use in the event of an air attack by Japan or any axis power from the West," he explained.

The Army's first complete air-borne battalion is now in process of formation at Fort Benning, Georgia, home of parachute-troop instruction, it was recently announced by Secretary of War Stimson. The unit will fly and drop motorcycles, bicycles and ordnance equipment. The initial group will be made up of 500 men but larger groups will be attempted if the tests prove a success.

The expanding military horizon of the United States was furthered with the announcement of new bases in Africa. These bases are located at Monrovia, Liberia and at Leopardsville, Belgian Congo for use as stopping-off points for the Ferry Command. The bases and routes are under development by Pan American Airways operating under a contract with the War Department. The equipment will be American owned and it is planned after the War to use them as bases for commercial trans-oceanic landplanes.

See Page 33

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A superb non-explosive, non-flammable material, low in cost and self-setting. You can build the whole plane from wing to fuselage, motor mount and all interior construction from the same basic material in any color you desire. You can construct your own transparent sections for cabins and turrets from crystal-clear AIR-O-PLASTIC. Ordinary paper and AIR-O-PLASTIC base material are all you need to build your own stringers, channel sections, tubular structure, spars, ribs, fire walls and propellers. Structures may be made rigid or flexible... and very hard to break, and by merely adding pigments, a brilliant array of colors are available for wing and fuselage coverings. You can use any plans by merely substituting AIR-O-PLASTIC for balsa wood.

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New aircraft worker wage rates have finally been agreed upon by Southern California aircraft manufacturers and the American Federation of Labor. They will mean an expenditure of more than one hundred million dollars by the five large aircraft companies in that region. Basic agreement included raises retroactive for the past six months and the establishment of 75c an hour as the minimum pay for workers after a three months' apprenticeship. Many different agreements were part of this contract including 6c an hour bonus for night workers and "pay for eight work for six and one-half hours" for men on the third or "grave-yard" shift.

AMERICA FIRST IN THE AIR

Gas Lines

(Continued from page 30)

Carroll Moon and Ed. Yulke acted as co-directors for the A.M.A. at the contest, which was sanctioned by the Academy. Sal Taibi was committee chairman, and was assisted by George Gilchrist, Art Mansfield and Pete Tryborn.

Officers of the Sky-Scrapers for the final six months of 1941 have been announced as: President, Art Mansfield; Vice President, Sal Taibi; Secretary, Bernard Liquorman and Treasurer, Peter Tryborn. The club has at present on its rolls nearly 50 active members; it has been in existence since 1938. Sal Taibi, the Club's Vice President, is 1941 Class C gas model champion, his new ship having taken first place at the Nationals in Chicago during July. Miss Doris Meyer is Corresponding Secretary of the Club. Carroll Moon is Senior Director. All correspondence with the Club should be directed to Miss Meyer at 44 Harte St., Baldwin, N.Y.

An unusual scale gas model was seen at the Philadelphia meet. It was a Ryan built by Kerson Bologh of Trenton, N.J. He is shown with his ship in picture 12.

Picture 13 shows the three winners, all of the "Bronx Thermaleers," of the Jackson model contest held near Throgg's Neck, New York City. These modelers took first place in the three events. They are, left to right: Clif Travis, Class A; Charlie Haux, Class B, and Richard Willard, Class C.

Those who have been flying models for a number of years will remember "Scotty" Murray, who was one of the outstanding fliers in the New York district. Scotty is a very serious and thorough young man. He was born in Scotland; consequently with the advent of war he felt inclined to do his part and signed up with the Royal Canadian Air Force. He was in training in Canada during the past year and now has graduated as Sergeant Pilot and has been sent to England for active duty. Here you see Scotty in picture 14. More power to him and we wish him luck in his great adventure. As soon as we know his address we will pass it on to modelers who may care to write him.

Pennsylvania

Despite the fact a stiff breeze was making the flying of gas models a real problem on September 14, at the Pittsburgh

Announcing 4 NEW WARPLANE MODELS

RYAN PT21 ★ BELL P39 ★ MARTIN B26 ★ CURTISS S03C1

NEW RYAN PT21 ARMY TRAINER



30" Span. Length 23". 1" Scale. Weight 3 oz.

A special feature of this model is its fuselage, which is completely covered with sheet balsa, then with tissue—giving it a beautiful appearance. Model has movable controls from cockpits. Set has all parts printed on balsa, set of paints, rubber, wheels, full size drawing, etc. Set, postpaid. **\$3.00**

NEW BELL P39 AIRACOBRA PURSUIT



34" Span. Length 30". 1" Scale. Color silver.

Exact in every detail of the real plane. This is the most perfect copy of the P39 on the market. Set has all parts printed on balsa, 3 oz. silver dope, 2 oz. glue, black, etc., turned wheels, insignia, rubber, carved propeller, full size scale drawing, and all parts. Set, postpaid. **\$3.50**

NEW MARTIN B26 U. S. ARMY BOMBER



40" Span. Length 35". 1/2" Scale. Color silver.

A beautiful model of the world's fastest bomber. Set has all parts printed on balsa, propellers, wheels, insignia, set of paints, glue, full size drawing, and all parts. Set, postpaid. **\$4.75**

CURTISS S03C1 NAVY SCOUT



30" Span. Length 27". Color silver and yellow.

An exact scale model of the latest Navy Scout. Carved propeller, insignia, wheels, rubber, etc. Const. set has all parts printed on balsa, silver, yellow, and black paint, glue, prop, full size drawing, and all parts. Set, postpaid. **\$3.00**

A beauty of the plane was built in Europe. All parts printed on balsa, set of colored paints, etc., etc. Set, postpaid. **\$2.50**

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Actual photograph of Spartan model



Actual photograph of Ryan model

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13 1/2"	Vultee Vanguard 48A	2.00
13 1/4"	Curtiss Hawk 75A	2.00
12"	Lockheed P-38	2.00
12 1/2"	Spartan Executive	1.50
12"	Consolidated PB2A	1.50
9 1/2"	Grumman F4F-3	.75
10"	Bell P39 Pursuit	.75
9"	Northrup A17A	.50
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9"	Fairchild	.50
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Butler Airport, over one hundred model aviation enthusiasts were on hand to try for the honors of the day, with approximately five hundred ships on the field.

The meet was run with all the usual strictness of Harry G. Vogler, Jr., in regards to the Academy of Model Aeronautics rulings, and was considered a huge success by those who competed. The contest was a progressive type with five events, handled as though each was a separate meet.

Winners were:

Class AB, Gas Powered R.O.G.	
Aaron Latkin.....	644.2
Peter Bila.....	520.4
Merle Kinsey.....	398.8
Archie Merritt.....	289.4
Class C, Gas Powered R.O.G.	
Kenneth DeLannie.....	635
August Andrusek.....	564
Joseph Scurio.....	449.9
Fuselage, Rubber Powered	
Merkel, Justus.....	263
Edward Gummell.....	251.8
Louis Emerich.....	207.2
Stick, Rubber Powered HL	
Louis Emerich.....	416.7
Owen Niehaus.....	370
Justus Merkel.....	357
Glider, T.L.	
Norbert Van Tuil.....	154.5
Edward Gummell.....	136
Owen Niehaus.....	120

Able staff work was done by: Shorty More, Field Judge, and Timers H. G. Vogler, Sr., John Thuer, E. Niehaus, Michael Rilko, Ed. DeLannie. The organization deserves a lot of credit for the work that they have been doing with model builders in this area.

West Virginia

The Moundsville Hobby Club held a model contest on Labor Day, and a marvelous exhibition was provided for about 5000 spectators. Prizes were awarded in an interesting manner; winners could choose from the prize group in the following order: Class C, 1st, 5th, 9th; Class B, 2nd, 6th, 10th; Class A, 3rd, 7th, 11th; Rubber Combined, 4th, 8th, 12th. Winners were as follows:

	Single Time in Seconds
CLASS C:	
Howard Wilson.....	311
M. D. Bonar.....	275
Tom Ferris.....	230
CLASS B:	
Tom Ferris.....	254
M. D. Bonar.....	252
Edward Vocas.....	238
CLASS A:	
M. D. Bonar.....	280
Louis Poplowski.....	209
Stanley Potter.....	163
RUBBER:	
Louis Poplowski.....	266
Raymond Potter.....	219
Aldean Darwish.....	166
HIGH TIME: Louis Ferris.	

Pennsylvania

Mr. Walter Beaumont of 8049 Ferndale St., Philadelphia sends us news of the Quaker City Gas Model Airplane Association meet held during September. Leon Shulman of Newark, N.J., won the high place trophy by securing the most points.

The MODEL AIRPLANE NEWS trophy was won by Ed Miller of Kearny, N.J. Twenty-one trophies, 30 models, merchandise and cash prizes, including an airplane mechanics scholarship worth \$475, were awarded.

California

Here is a bit of news from the West Coast. We always like to print such news as it apparently is scarce; those on the West Coast seem to be so busy building models they have no time for "pushing a pen" or "pounding a typewriter." We would like to see more of our Westerners take time out to send M.A.N. an account of their activities or clubs to which they belong.

Bill Steese of the East Bay Aeronceers Association, 2819 Telegraph Ave., Oakland responds to our appeal and tells us a club contest was held recently in which 5 stop-watches were given for prizes. Harold Austin won first in Class A-B. Second place went to Tony Mello and third to Dunk Ingraham. Don Foote and Bill Steese were first and second in Class C, with respective average times of 24 min. 48 sec. and 24 min. 37 sec.

Steese says the ship that he flew was designed by Don Foote, who holds both the A.M.A. R.O.W. and R.O.G. records in Class C Open. Steese continues: "When the boys around here began to say Don was the only guy that could fly the 'Westerner,' he gave me the plans just to prove to them they were wrong. This was the first contest I have entered the ship in, and boy is it a honey!"

"Don just loves to ruin all the theories of the local 'experts,' and that's why he built another ship exactly the same as the Westerner except that the fin starts at the wing and runs right down the boom to the rudder to form one enormous fin. There is no sub-rudder on either ship.

"This design was born when a timer at one of the contests told Don that his Westerner went out of sight too quickly because of lack of side area. Don jokingly said that he'd fill it in from the wing to the rudder. It was then the ever present group of 'experts' piped up with the old familiar 'It won't work'. Results—Don started building the job that night. When the 'experts' saw the new job in the making they began to worry about their reputations, so they built gliders of this design and—they didn't work! Reassured by these 'scientific experiments' the 'experts' talked louder, but Don kept right on building his ship. Final result—a thoroughly squelched group of 'experts'. However, Don admits that this job is not nearly as good a ship as the Westerner, and now that he has thrown the 'experts' for a loss, he is going back to this faithful and excellent design."

Missouri

About 8,000 spectators watched the outdoor events of the Ninth Annual Mississippi Valley Model Airplane Meet at Parks Auxiliary Airport, near Belleville, Ill. Five hundred contestants from fourteen states competed, and there was a special class for soldiers, which found entrants from Scott Field, Jefferson Barracks and Chanute Field. A strong breeze was responsible for several spectacular

crashes—and many planes flew out of sight, with their builders chasing them for miles. New records for indoor cabin, indoor stick and indoor ornithopter events were set by Jim Cahill, Milton Huguelet and Carl Goldberg, respectively, at the St. Louis Arena.

Carl Goldberg, champion Chicago model builder, won the Junior Chamber of Commerce trophy and the title of All Mississippi Valley Champion held last year by Jim Cahill, Connersville, Ind., who was this year's runner-up. Carl as well as Jim had to pass up a scholarship donated by the Atlas Aircraft Trade School of St. Louis, and the scholarship was then awarded to Keith Kraigh of Columbia, Mo.

The Stix, Baer & Fuller trophy for the best St. Louis contestant was won again by last year's winner, Ray E. Podolsky, 26 years old, who had to leave the following day on active duty as a commissioned officer at Camp Shelby, Miss.

Pvt. Delafield Benthall, 20-year-old

Scott Field soldier who designed and built his entry by working all night Saturday, captured the All-Soldiers Sweepstakes, in a class of 35 contestants. The meet was well publicized, and newspapers and radio stations once again proved mighty cooperative.

Lieut.-Col. Walter T. Meyer and Maj. G. Edwin Popkess of Scott Field were featured speakers at the banquet at the DeSoto Hotel at which the 120 prizes were awarded, with a young actress presenting the trophies to the winners. Robert H. (Bob) Sommers was the efficient contest director of the meet which was sponsored by Stix, Baer & Fuller and the Young Men's Division, St. Louis Chamber of Commerce.

Results follow:

Indoor Cabin Event

Jim Cahill, Connersville, Ind.....17:21.9
Walter C. Erbach, Sheboygan, Wis.....15:35.1
Alvin Rohrbaugh, New Haven,

Ind.14:56.1

Indoor Stick Event

Milton Huguelet, Chicago, Ill.....23:49.0
Joseph Matulis, Chicago, Ill.....21:34.8
Jim Cahill, Connersville, Ind.....21:14.1

Indoor Ornithopter Event

Carl Goldberg, Chicago, Ill..... 3:36.6
H. Parnell Schoenky, Kirkwood, Mo. 1:20.1
Haines Schoenky, Kirkwood, Mo.. 1:15.0

Gas Power Class C Senior

Bob Wright, Topeka, Kan.....17:18.6
Joe Oshanna, Evanston, Ill.....14:22
Vernon Hahn, St. Louis, Mo..... 9:42

Gas Power Class C Open

E. S. Beckman, St. Louis, Mo.....15:1
Arthur Treppier, St. Louis, Mo.....14:6
Carl Goldberg, Chicago, Ill.....13:6

Towline Glider

George Lambrod, St. Louis, Mo..... 1:48.8
Robert Dunham, Tulsa, Okla..... 1:42.6
Donald Talbott, Tulsa, Okla..... 1:40.5

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Outdoor Stick Senior

Joe Limosani, Chicago, Ill.....15:00.5
Robert Bessler, Washington, Ill.....11:29.3
Keith Kraigh, Columbia, Mo.....11:09.9

Gas Power Class A

R. E. Podolsky, St. Louis, Mo.....15:34.7
Carl Goldberg, Chicago, Ill.....9:49.5
Vernon Hahn, St. Louis, Mo.....9:42.0

Outdoor Stick Open

Joe Vermach, Chicago, Ill.....10:36.0
Jim Cahill, Connersville, Ind.....9:23.2
Donald Justice, Topeka, Kan.....7:14.7

Outdoor Cabin Open

Jim Harris, Indianapolis, Ind.....12:15
Frank Vollrath, Indianapolis, Ind.....11:18.3
Donald Justice, Topeka, Kan.....10:16.8

Outdoor Cabin Senior

Buddy Cope, Tulsa, Okla.....10:36.1
Don Emmich, Jr., Tulsa, Okla.....10:34.4
Gene Garrell, Mexico, Mo.....9:21.4

Gas Power Class B Open

K. G. Pfeiffer, Piggott, Ark.....9:32.0
Herman Batt, New Castle, Ill.....6:02.8
M. Fitzpatrick, St. Louis, Mo.....5:59.2

Gas Power Class B Senior

Alfred Latta, St. Louis, Mo.....8:02.5
Keith Kraigh, Columbia, Mo.....6:33.1
Bill Bucher, Kansas City, Mo.....6:16.2

All Soldiers' Sweepstakes

Pvt. Delafield Benthall, Scott Field, Ill.
Pvt. Lowell Southam, Scott Field, Ill.
Pvt. George Losey, Scott Field, Ill.

Michigan

Donald J. Gridley, 192 Oak Street, Ypsilanti, sponsor of the Hornet Gas Model Club, writes and tells us of a remarkable flight (total flight time of 64 min.) made by Gerald R. Holly, a club member, at a contest at the Ann Arbor Airport. Gerald's longest single flight time was 47 min., whereas the national record for total average flights in Class C is 44 min. Unfortunately all flights at the Ann Arbor meet were hand launched, consequently the new national record cannot be claimed; records require R.O.G. take-offs.

Mr. Gridley says the remarkable thing about the flight was Gerald was flying a plane of his own design. (Editor's note: Apparently the model builders are making a comeback and out-distancing commercial concerns.) The ship was powered by a Tiger engine. Gerald was recently 17 and this fall entered the Aeronautical Engineering School of the University of Michigan.

China

We have rather an interesting letter from R. D. Willoughby, Corporal, U.S. Marine Corps who is stationed at the Marine Detachment, American Embassy, Peiping. He makes one or two comments of interest:

"Last winter I bicycled out to the new civilian airport but the Japanese sentries wouldn't let me beyond the electrified barbed-wire fence. On the field I saw two Japanese transports and a Lockheed '12'. Almost every day a speedy Lockheed flashes overhead, bound for Shanghai, but just once in a while do I see a Japanese

CLIMBING ABILITY WITH A-C PROPS!

Machine made, tough magnolia wood, sanded and perfectly balanced by hand. Heavy enough to give good flywheel action, yet breaks before bending the shaft. Sizes 9, 10, 11, 12, 13 and 14 inches.



Impartial Tests
Flight tested on several models with 3 other leading props, A-C Props showed a decided increase in thrust with less torque effect than any other make tested. Look for the name Austin-Craft on the blade—genuine A-C Props cost no more.

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military plane and never any Chinese.

"Recently I built a 'Dictator' powered with a Syncro B-30 and glided it, but evidently I miscalculated on the engine placement for it was far too nose heavy. Since that time I have had orders to return to the U.S. and had to put my motor in my trunk, thereby curtailing any further testing. It looks like I will have to leave my third gas job out in China."

Model Airports

We have one or two letters requesting information on how to establish model airports: one from Jack Moralex, Lawlor Sporting Goods Company, Lincoln, Nebr., and another from Mr. E. C. Wilson, Box 137, San Angelo, Texas. They wish to establish airports in their community.

These letters will be passed on to the Academy of Model Aeronautics in Washington, with the request that they stimulate the action of the NAA adult groups in the communities.

To all those who are interested in establishing model airports we suggest they write the A.M.A., Willard Hotel, Washington, D.C., requesting them to send the names of leaders of the NAA group. The first step then is to contact these men and gain their support in establishing model airports. Requests to senior NAA groups should be made to gain every assistance and obtain necessary capital, land and otherwise promote the project. We also suggest those interested in airports contact their local Rotary and Lions Clubs, or other civic organizations.

Luck alone WON'T DO IT! *Hard wishing AND hoping CAN'T!*

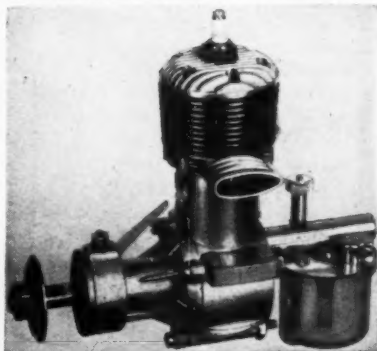
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\$18.75

COMPLETE

"B" class, .297 in. displ.,
1/5 H.P. at 7200 R.P.M.

FORSTER BROTHERS

1415 Lake Street

Melrose Park, Illinois

The Cicada

Bobby Thompson writes us of an interesting experiment. He says:

"In a back issue I saw 'the fly-powered airplane' and got an idea: A similar plane called 'The Cicada,' commonly known as a locust. The ship is made by cementing a pair of locust wings to a small fuselage of 1/32" sheet balsa, shaped similar to a fuselage of a glider. The whole ship had a span of about 2 in.; a 1/4" dihedral on each wing tip was used. The stabilizer and fin also were made from the locust's wings. The ship flew beautifully, making many successful flights, one of which was for 64 sec."

Notices

Robert Fetter of 93-30 220 Street, Queens Village, N.Y., writes:

"On August 17, my Comet 35 and Zipper were stolen. The motor number was 1193. The ship had a red fuselage with blue trim and a yellow wing and tail. If anyone can inform me of the whereabouts of the ship or motor please communicate with me at above address. Thank you."

Mr. Water Nunn, president of the

Easton Aero Club, 2510 Gentilly Blvd., Easton, Pa., calls for help. He has a complete file of MODEL AIRPLANE NEWS except for two issues: June 1937 and September 1939. He would like to purchase these issues from any builder who may have them to spare.

Eduardo Enchelmayer B., Independencia 1869, Valparaiso, Chile, South America, would like to contact some boy or girl who is interested in postage stamps issued in Chile or nearby countries. Eduardo is not interested in stamps but in pictures and plans of model planes, engines, etc. He would be glad to send stamps of his and neighboring countries in exchange for aeronautical publications. Mr. Enchelmayer is 22 years old and an enthusiastic model builder. We hope some stamp enthusiasts will contact him.

Here is a notice we print with regret. Possibly many readers will remember Raymond J. Caritti, Jr., of 720 Woodward Avenue, Ford City, Pa., who died recently. Ray was 15 years old. He is survived by his parents, sister and brother. Ray was a sophomore in Kittanning High School and won a number of awards in model contests which he entered.

NEW CATALOGUE

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New War Wings

(Continued from page 30)

The fear-stricken name of Gotha is once again going to be spoken in London when the Gotha Go-155 bomber makes its appearance. Long in design and continually changed to meet new specifications, this fast four-motored bomber is by far the sleekest German product yet to take the air. The two inboard motors are half-hidden in the wing, the outboard motors neatly cowed. The ship has no exposed bumps or knobs and is as slick as a whistle. Present powerplants are Daimler-Benz 1,375 hp. engines and the ship has two power-operated turrets including one in the tail.

A new light bomber is the Junkers Ju-88A, a development of the deadly Ju-88 previously described as the Luftwaffe's most efficient raider. This new model is reported to be of transparent plastic material making it invisible at even moderate altitudes. Two 1,140 hp. Junkers Jumo engines with special silencers, making them absolutely noiseless, are installed; this should become literally a hush-hush bomber.

Not a plane or engine but certainly an aerial weapon is the new Wolkenronterger Ray, a secret Luftwaffe device for blind flying. This device is used with three different squadrons of bombers, the noses painted either red, blue, green or yellow. Still a complete mystery, this device supposedly focuses on these colored noses and directs the bombers to their objectives.

ROYAL AIR FORCE—ENGINES:

Three new British engines are in production and two more on test blocks. Most formidable is the Napier "Sabre", 24-cylinder "H" liquid-cooled engine which turns out a staggering 1,800 horsepower at best operating altitude and a sensational 2,350 horsepower for takeoff! A bigger version of the famed "Dagger VIII" "H" engine, this new giant is the most powerful aircraft engine yet installed in a military airplane. The new Rolls-Royce "Vulture" packs a 2,000 horsepower wallop in its 24 cylinders arranged in an "X"; is actually two "Merlins" stuck together. There are four banks of six cylinders each and a direct injection fuel system is used. Still another product of this venerable firm (which has been in the engine business for fifty years) is the Rolls-Royce "Griffin", a 1,600 hp. adaptation of the straight Merlin. Using higher supercharging, more efficient bearing and carburetion, the "Griffin" is even more compact than the Merlin, despite its greater output.

Still in the experimental stage is the Bristol "Menetor", a sleeve-valve job of the air-cooled variety kicking out 2,200 hp. from its 14 cylinders. The DeHavilland "Gipsy Twenty-Four" is a wallowing 24 cylinder liquid-cooled "X" engine purportedly delivering 2,000 horsepower at altitude and 2,400 for takeoff.

FIGHTERS: Most highly publicized new R.A.F. fighter is the Hawker "Tornado", an all-metal bigger and more deadly version of the Hurricane, with additional eight machine guns and two cannon. Powered by the 2,000 hp. Rolls-Royce "Vulture" this 425 mph. fighter is now in quantity production.

More powerful yet is the mysterious Hawker "Typhoon" in which England is

GRUMMAN F3F1 U. S. NAVY SHIPBOARD FIGHTER



32" Span. Length 24". 1" Scale

A fine detailed model with retractable landing gear, 4" turned balsa motor front, 3 oz. grey dope, 1/2 oz. yellow, 2 oz. glue etc., all parts printed on balsa, 10" propeller, wheels, rubber motor, full size drawing, and all parts. This fighter plane is used in large numbers on the aircraft carriers. Const. Set complete. **\$3.75** postpaid.

CURTISS HAWK F11C4 PURSUIT NAVY



32 1/2" Span. Length 22 3/4". 1" Scale. Weight 6 oz. Color grey, top wing yellow. **THE MOST EXCLUSIVE AND FINEST EQUIPPED MODEL IN THE WORLD. MOVEABLE CONTROLS WORK FROM COCKPIT.** A special de luxe model, one of the most beautiful ever made. Set contains a 1 1/2" scale Wright Cyclone celluloid motor, detailed push rods, fins, etc., like real motor, 4 1/2" aluminum cowl, 10" steel type carved prop shown, 2 1/2" wheels, tail wheel, star and rudder insignia and lettering, rubber, windshield, instrument board, flying wires, 4 aluminum step plates, aluminum wing walks, ready cut wheel pants, washers, 3 oz. grey paint, 1/2 oz. yellow, 1/2 oz. red, 2 oz. glue, etc. All other parts are printed on balsa wood. 33"x44" scale drawing. Const. set, complete in labeled box, postpaid. **\$4.50**

NEW TAYLORCRAFT SPORTPLANE



36" Span. Length 22". 1" Scale. Weight 2 oz.

COMBINATION LAND AND SEAPLANE SET
A beautiful exact scale flying model with unusual flying range, so light it will rise from land or water in 6 feet. Const. set contains all parts printed on balsa, carved propeller, hardwood wheels, 2 oz. white dope, 1/2 oz. black, glue, full size scale drawing, all parts to build, and parts to make floats. Set p.p. **\$1.50**

BOEING B-17 FLYING FORTRESS BOMBER



44" Span. Length 30". Color, silver. Weight 6 oz.

Set has all parts printed on balsa, four 3" turned balsa motor fronts, four 3" carved props, celluloid wheels, set of paints, glue, and full size drawing. **\$4.50** Set, postpaid.

De luxe set with 4 aluminum cowl, 4 celluloid motors, 4 metal props, and 2 M & M air wheels. **\$6.25** Set, postpaid.

CURTISS P36 ARMY PURSUIT



37" Span. 1" Scale. Color, silver

Set has turned motor front, set of paints, glue, all parts printed on balsa, and full size drawing. **\$3.25** Set, postpaid.

BOEING P26A ARMY PURSUIT



22" Span. Length 17 1/2". 3/4" Scale

Set has all parts printed on balsa, 3" celluloid motor, 3 1/4" tapered aluminum cowl, set of colored paints, scale drawing, and all parts. **\$2.75** Set, postpaid.

NEW 1942 CATALOG NO. 7-10c

Beautifully illustrated 7 1/2"x9 1/2" 16 page catalog showing large photos of Army and Navy Fighters, Gas Motors, Gas Models, etc. Get yours today. 10c coin.

9-FOOT 1941 TAYLORCRAFT GAS MODEL



9 Foot Span. Length 66". 3" scale

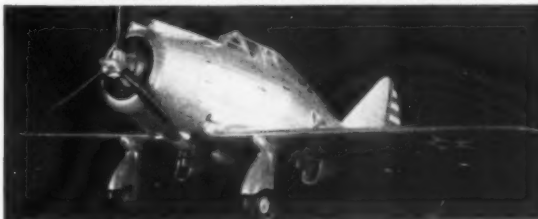
MODEL 1/4 SIZE OF REAL PLANE. CAN USE RADIO CONTROL

One of the easiest gas models to build. Has special wing airfoil for slow landings. Set has ready cut wing ribs, gear struts, nose piece, etc., set of paints, dope, glue, etc. Model weighs 3 3/4 lbs. without motor, suitable for radio control. Lifts 4 lbs. additional weight. Full size drawing. Const. set, postpaid, less wheels and motor. **\$15.00**

Additional equipment if desired:

18" carved propeller.....	\$ 1.50
5 yards silk.....	2.50
1 pair 4 1/2" M & M Air Wheels.....	2.75
1/2 h.p. Forster Gas Motor.....	20.75
1/2 h.p. Brown, Jr., Gas Motor, Type B.....	16.75

SEVERSKY P35A ARMY PURSUIT



32" Span. Length 25". 1" Scale. Color, Silver

Set has 4" turned balsa motor front, 10" carved prop, balsa wheels, tail wheel, rubber, all parts printed on balsa, 3 oz. silver dope, 1/2 oz. black, 2 oz. glue, etc., insignia, and full size scale drawing. New improved model has retractable landing gear and movable controls from cockpit. Set, postpaid. **\$3.25**

BOEING F4B4 NAVY FIGHTER



22 1/2" Span. Length 14 1/2". 3/4" Scale.

Set has 3" celluloid motor, 3 1/4" tapered aluminum cowl ring, set of paints, etc. **\$2.95** Postpaid.

CURTISS F11C4 SOLID MODEL



10 1/2" Span. Length 7 1/2"

This is a special de luxe solid model. Set has completely finished balsa fuselage, cockpit cut out, routed pants, wings cut to shape, 1 1/2" de luxe cast motor, alum. cowl, 3 bladed cast prop, paints, **\$1.50** drawing and all parts. Set p.p.

NORTHROP A-17 ARMY FIGHTER



24" Span. Length 16 1/2". 1/2" Scale.

Set has 7" prop, turned motor front, wooden wheels, complete set of paints, all parts printed on balsa, scale drawing, insignia, and all parts. **\$2.50** Set, postpaid.

ORDERING INSTRUCTIONS

Orders sent west of Mississippi, add 15c postage—Foreign, 30c.

MINIATURE AIRCRAFT CORP. 83 DANIEL LOW TERRACE STATEN ISLAND, N. Y.

placing its greatest faith in the Battle For Britain. Now in all-out production, this deadly single-seat fighter is powered by the huge Napier "Sabre" 2,350 hp. motor. The new nose is high but thin and top speed of "well past the 400 mile mark" has been absolutely guaranteed.

The new Westland "Whirlwind" is a two-engine fighter similar to our Grumman "Skyrocket" and is powered by two new Rolls-Royce "Griffin" engines. It is designed to carry either one or two men and has eight machine guns and a large bore cannon in each of its outboard engine nacelles.

The new Spitfire is a clipped-wing version of the deadly interceptor; has a square-tipped wingspan of only 33 feet 8 inches, 3 feet 8 inches shorter than the previous model. Powered with the new improved Merlin, this later model, the Mark IV, crowds the 400 miles-per-hour figure comfortably close and little change in tooling is required so that vast numbers of this new version are already in the air.

The new Boulton-Paul "Guardian" is a sleeker, more deadly version of the "Defiant" (M.A.N. April 1940 issue) with its four-gun power driven turret. The new Rolls-Royce Griffin motor is in the nose and this two seat monoplane will have a top speed of 400 miles per hour, carrying that big death-dealing turret higher and faster than it has ever been carried before.

BOMBERS: The new Royal Air force bombers, with which Britain plans to win the war, are bigger, faster, more adequately defended. The Avro "Manchester" is a fast (325 miles per hour) two-motor destroyer with a span of 93 feet and length of 64 feet 8 inches. It has a gross weight of 24,600 pounds, carries a crew of three. It will carry its 6,000 pound bomb load to 33,000 feet and has a range of 2400 miles. Power is two new, improved Merlins.

The Short Sterling is Britain's own "Flying Fortress," a four-motor (Bristol "Hercules" 1,375 hp. sleeve-valve air-cooled) monoplane with a gross weight of 71,000 pounds, 8500 pounds of which are lethal capsules.

Another giant is the Handley-Page "Halifax" a four-motor ship (buried Merlins of 1,250 hp. and three power-operated four-gun turrets). The tail turret has been designed to rotate downwards and the tail surfaces are placed high with the twin rudders at the horizontal stabilizer extremities. The ship is sleek and has but one blemish, the deadly upper gun emplacement with a full 360° field of defending fire. Six tons of bombs can be carried at 325 miles per hour.

The Armstrong-Whitworth "Whiteside" is still another quadri-motor flying battleship built to same specifications as the Halifax and Stirling. Four Rolls-Royce "Griffins" deliver power and the entire undersurface of this giant are bomb bays.

The DeHaviland "Dictator", (wonder where they got that name?) is a two-engine high speed bomber with nose, tail turrets and four forward-firing machine guns. Fastest of the lot, it will carry four tons of bombs to Berlin at a 350 mile-per-hour clip. Four men make up the crew.

The Fleet Air Arm, whose work has been vital in this war, will get new equip-

ment in the form of the Fairey "Olympiad," a twin engine Naval attack-bomber to operate from Naval establishments or from carrier decks. Fast and carrying two one-ton torpedoes in its bomb hold, this job is powered by two new Bristol sleeve-valve "Hercules" of 1,375 horsepower each and has a nose turret and upper-rear turret.

Other new improved service models, the Blackburn "Botha" development of the DeHaviland "Fleming" with a streamlined upper turret and external bomb racks, the Fairey "Albacore," biplane seaplane torpedo plane; the Fairey "Fulmar," development of the "Battle," and improved versions of Blenheim and Wellington bombers.

These then are the "New War Wings Over Europe" with which dictatorships and democracies will wage war in 1941-42. There's the picture, you draw the conclu-

sions. But bear in mind, with each year will come even bigger, faster and more deadly war wings. The pressure is on, both sides are driving their designers and builders with a fiendish anxiety. The war will be won by the side with the biggest and the most potent air force, not one or the other, but both. Germany has the biggest, Britain the most potent. Tomorrow's war wings will be even bigger, even more potent. But that's the picture for this year. What do you think?

NOTE: We wish to acknowledge valuable assistance given us by Mr. C. G. Grey, prominent British aviation analyzer, in preparing this article.

FINIS

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SHIP!**



COMET has gone "all out" on the Vultee Vanguard! Its famed designing staff and huge production facilities have created a truly great model at a moderate price. Comet comes through with this exact scale flying model (1 1/4 in. to 1 ft.) of the ship which is performing so valiantly for the British, with its top speed of 350 m.p.h. and deadly armament of 6 machine guns. Model-builders will enthuse over the movable controls, retractable landing gear, bomb-dropping device and other outstanding features. Wingspan 43 3/4 inches.
Kit No. T2

\$150

Postage 25c
None if ordered
from dealer.

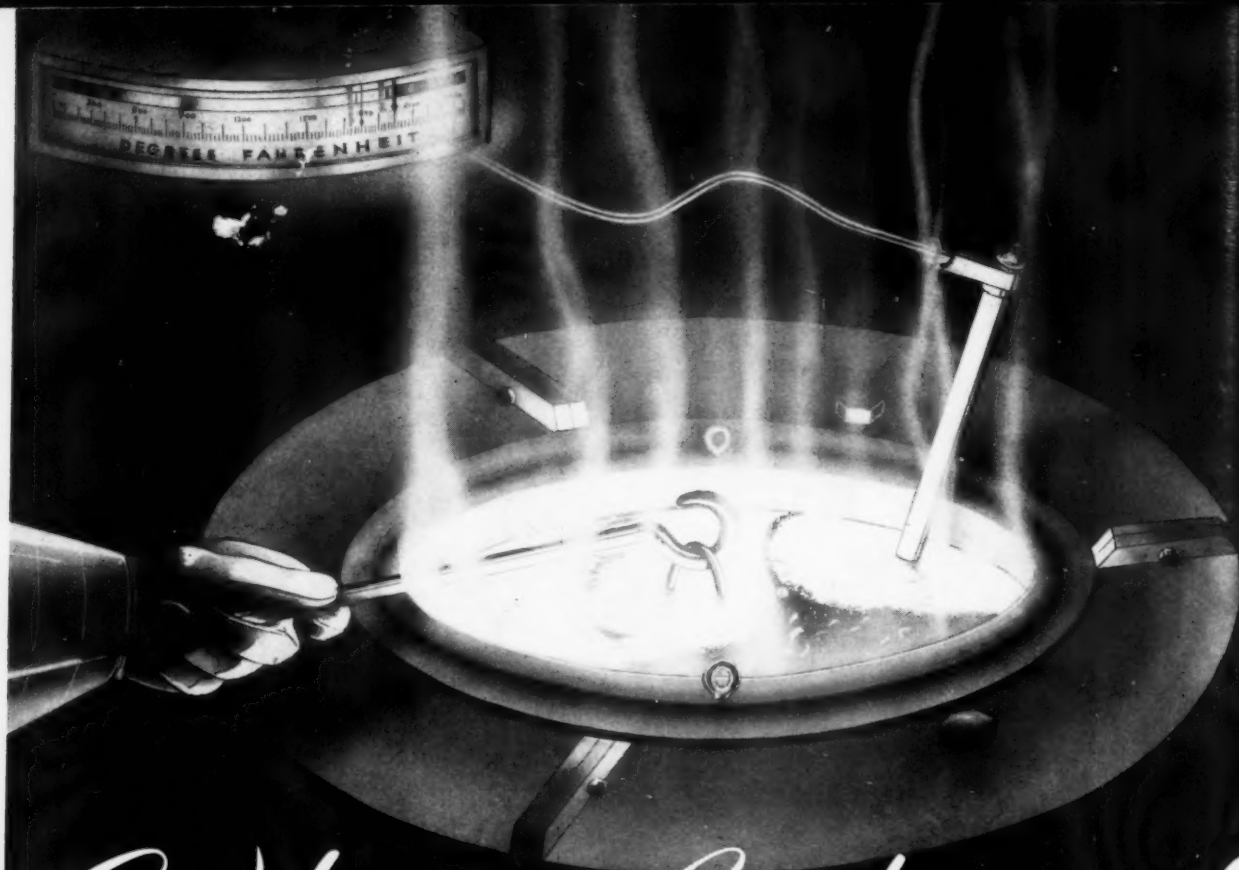
• SEE IT AT YOUR DEALER'S NOW •

COMET MODEL AIRPLANE & SUPPLY COMPANY

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What's Cooking?

OUR new 60 Special really revs up. "Hottest motor ever to come off the Ohlsson & Rice test rack" is what modelers are reporting from all parts of the country.

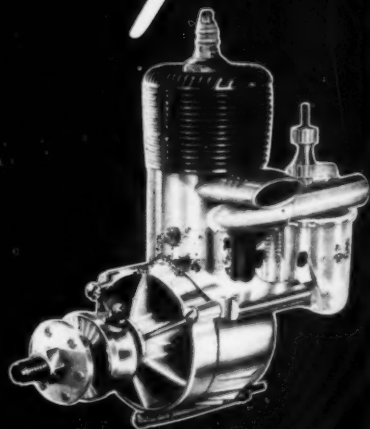
Old-timers who thought they had seen everything have had their eyes opened by the power and instant response of this new Class C motor! From all indications it looks as if more big ships would be built and flown this winter than in any previous period of this important class.

The *Special*, as we announced two months ago, is ALL ENGINE, all performance. Plenty of thrills, but no frills. Everything we have learned about building quality motors in all three classes has gone into it. Every part has been built in the Ohlsson & Rice plant under the most modern methods, to the closest tolerances used in miniature engine building.

Yet instead of being UP in price, this newest motor is offered at a valuable saving to modelers, which we cannot guarantee indefinitely—so get yours TODAY while they last at this price.



Illustrated above is the special salt-bath heat treating process used by Ohlsson & Rice to produce glass-hard, smoother-operating longer-wearing surfaces on vital motor parts. This is not only the latest ultra-modern method of steel-treating—but also an extra step in producing quality motors which ordinary motors do not receive. It increases wear as much as 100 times.



SPECIFICATIONS

Bore and stroke.....	15/16" x 7/8"
Displacement.....	.60 cubic inches
Rating.....	7500 R.P.M.
Static thrust.....	4 1/4 lbs.
Bare engine weight.....	9 oz.

OHLSSON & RICE *Manufacturing Company*

OHLSSON 60 Special ..\$18.50

OHLSSON 23.....\$16.50

OHLSSON 19.....\$14.50



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2



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R.P.M.
1 1/4 lbs
.....9 oz

any
\$14.50